A CLASS™

Operator's Manual

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Part Number: 88-2305-01

Revision G

Agency Compliance and Approvals:

UL60950 Information Technology Equipment
C22.2 No. 950-M93

EN60950

For 230 Volt Operation (Europe): Use a cord set, marked "HAR," consisting of a min H05VV-F cord which has a minimum 0.75 square mm diameter conductors, provided with an IEC 320 receptacle and a male plug for the country of installation rated 6A, 250V

Für 230 Volt (Europa): Benützen Sie ein Kabel, das mit "HAR" markiert ist, bestehend mindestens aus einem H05VV-F Kabel, das mindestens 0,75 Quadratmillimeter Drahtdurchmesser hat; sowie eine IEC320 Steckdose und einen für das Land geeigneten Stecker, 6A, 250 Volt.

As an Energy Star Partner, the manufacturer has determined that this product meets the Energy Star guidelines for energy efficiency.

The manufacturer declares under sole responsibility that this product conforms to the following standards or other normative documents:

EMC: EN 55022 (1993) Class B
EN 50024 (1998)

Safety: This product complies with the requirements of
EN 60950/All: 1997

FCC: This device complies with FCC CFR 47 Part 15 Class A.

☑ ***Note:*** *This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions in this manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

DECLARATION OF CONFORMITY

(In accordance with EN 45014)

We,

Datamax Corporation
4501 Parkway Commerce Boulevard
Orlando, Florida 32808

declare under our sole responsibility that the product,

Type of Equipment: **Thermal Transfer Printer**
Model Numbers: **DMX-A-4212**
DMX-A-4310
DMX-A-4408
DMX-A-4604

to which this declaration relates is in conformity with the following standards or other normative documents:

Safety: **The product complies with the requirements of the Low Voltage Directive 73/23/EEC, EN 60950/A11: 1997**

EMC:
EN 55022 (1993) Class B
EN 55024 (1998)
EN 61000-4-2 (1995), 4kV CD
EN 61000-4-3 (1996), 3 V/m, (80%) AM
EN 61000-4-4 (1995), 500V Signal Lines
1kV AC Power Lines
EN 61000-4-5 (1995), 1kV
EN 61000-4-6 (1996), 3V (80%) AM
EN 61000-4-8 (1994), 1 A/M
EN 61000-4-11 (1994)
EN 61000-3-2 (1995)
EN 61000-3-3 (1995)

following the provision of EMC directive 89/336/EEC.

I, the undersigned, hereby declare that the equipment specified above conforms to the directives and standards as specified.

William M Bouverie 10/6/03
Signature and Date

William Bouverie – CEO
Typed Name and Title

European Contact: **Datamax International**
Herbert House, 12 Elizabeth Way
Pinnacles, Harlow
Essex, CM19 5FE, U.K.

DECLARATION OF CONFORMITY

(In accordance with EN 45014)

We,

Datamax Corporation
4501 Parkway Commerce Boulevard
Orlando, Florida 32808

declare under our sole responsibility that the product,

Type of Equipment: **Thermal Transfer Printer**
Model Numbers: **DMX-A-6212**
DMX-A-6310

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Safety: **The product complies with the requirements of the Low Voltage Directive 73/23/EEC, EN 60950/A11: 1997**

EMC:
EN 55022 (1993) Class B
EN 55024 (1998)
EN 61000-4-2 (1995), 4kV CD
EN 61000-4-3 (1996), 3 V/m, (80%) AM
EN 61000-4-4 (1995), 500V Signal Lines
1kV AC Power Lines
EN 61000-4-5 (1995), 1kV
EN 61000-4-6 (1996), 3V (80%) AM
EN 61000-4-8 (1994), 1 A/M
EN 61000-4-11 (1994)
EN 61000-3-2 (1995)
EN 61000-3-3 (1995)

following the provision of EMC directive 89/336/EEC.

I, the undersigned, hereby declare that the equipment specified above conforms to the directives and standards as specified.

William M Bouverie 1/19/04
Signature and Date

William Bouverie – CEO
Typed Name and Title

European Contact: **Datamax International**
Herbert House, 12 Elizabeth Way
Pinnacles, Harlow
Essex, CM19 5FE, U.K.

Important Safety Instructions:

Throughout the literature accompanying this unit, the exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions.

This unit has been carefully designed to provide years of safe, reliable performance. However, as with all electrical equipment, there are some basic precautions that you should follow to avoid personal injury or damage to the printer:

- Before using the print engine, carefully read all the installation and operating instructions.
- Moving parts are present during operation – keep body parts, loose clothing, etc. away from the mechanism.
- Observe all warning instruction labels on the print engine.
- Mount the print engine securely in the applicator system.
- Do not place the print engine on or near a heat source.
- To protect from overheating, make sure no openings on the print engine are blocked.
- Never insert anything into the ventilation slots and openings of the print engine.
- Do not use the print engine near water or spill liquid into it.
- Ensure that the AC power source complies with the ratings listed for the print engine.
- Do not place the AC power cord where it can be stepped on. If the AC power cord becomes damaged, replace it immediately.
- Consult only qualified, trained personnel to perform service on this print engine. There are no user-serviceable parts are inside; do not remove the cover.

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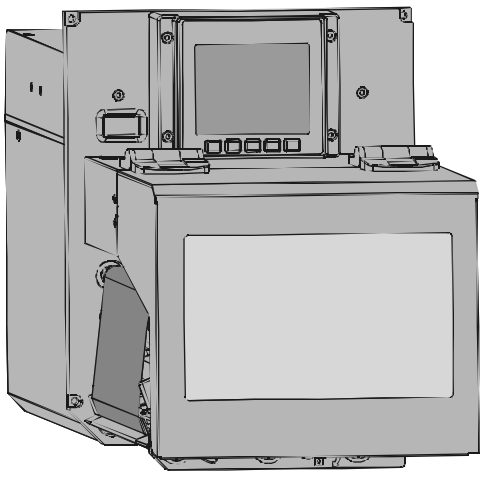
Overview

1.1 About the Printer

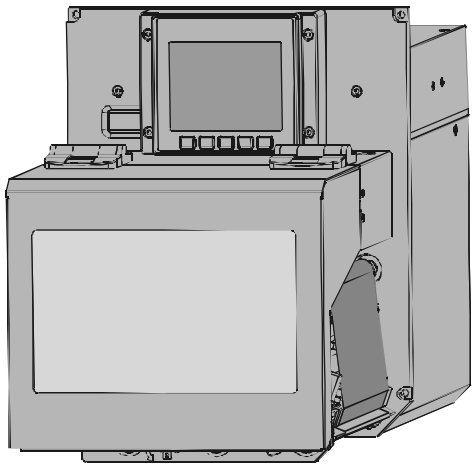
Congratulations on your purchase of the A-Class print engine. This print engine (hereafter referred to as "the printer" and, when necessary, the A-4xxx or A-6xxx to differentiate between the four and six inch model sizes) is designed for professional integration into an automated high-volume, high-speed industrial label applicator system. Featuring an advanced user interface and a Motorola Coldfire® 32-Bit microprocessor, this printer offers many standard and optional configurations for outstanding performance, management, and connectivity within your system.

This manual provides all the information necessary for installation, setup and operation. To begin printing, refer to the instructions provided with your label-creation software; or, if you are writing custom label programs, the *Class Series Programmer's Manual* has been included on the enclosed Datamax Accessories CD-ROM for your convenience. (This manual is also available on our web site at http://www.datamaxcorp.com).

For easy reference, the printer's model number is located on the Serial Tag affixed to the inside of the front cover. Use this model number when referencing specific information within this manual. The following subsections detail the standard and optional features for the A-Class printer.



Left Hand Model



Right Hand Model

1.1.1 Standard Features

This printer offers the following standard features:

- Right-handed or left-handed configurations
- Electronics card cage
- 4 MB Flash downloadable program memory
- 16 MB DRAM memory
- Host computer accessible memory for object temporary storage
- Two RS-232 serial interfaces (one of which is also RS-422/RS-485 capable)
- One IEEE 1284 compliant parallel interface
- One USB v1.1 interface
- A programmable GPIO Port
- Backlit ¼ VGA graphic display panel
- EFIGS (English, French, Italian, German, and Spanish) display languages
- Industry standard bar code symbologies
- Time stamp at print capability with time and date battery back-up
- Static brushes
- Printhead resistance verification
- Configurable fault-handling capability with reprint and void selections
- Parse error-tolerant command language interpretation
- Internal test labels for verification, validation, and configuration
- Multiple setup restore capability
- Paper retract control after print
- Ribbon low detection and warning
- Power-up, mode, and resident option hardware diagnostics
- Option hardware auto-detection
- Media peel bar
- Media inch counters
- Input line mode (ASCII text input) capability
- Firmware upgrades downloadable
- AGFA Scaleable Font Engine featuring dynamic font attributes

1.1.2 Optional Features (available for all models, except as noted)

The printer offers the following optional features:

- ***DMXNet*** – a network interface card that enables the printer to communicate over an Ethernet® network under a variety of operating systems including NetWare, Windows 95/98/2000/ME/XP, Windows NT™, and UNIX™. Some of the features are listed below:
  - Automatic selection of 10Base2 (Thinnet) or 100BaseT Fast Ethernet connection.
  - Integral HTTP Server to allow monitoring and management from a standard Web browser program.
  - Peer-to-Peer (serverless) discovery and printing from Windows 95/98/ME/XP or Windows NT/2000 workstations without a Novell file server present.
  - FTP printing to allow printing from a Web browser or other FTP client.
  - Dynamic Domain Name Service (DDNS).
  - Lightweight Directory Access Protocol (LDAP).
  - Novell "YES" certified.
  - Novell NetWare PSERVER (bindery-based and Novell Directory Services (NDS).
  - LPR/LPD over TCP/IP for UNIX platforms and Microsoft's Windows.
  - Raw sockets support over selectable TCP/IP port with filters for selected UNIX environment.
  - IP and IPX SNMP support of MIB-2, proprietary NIC MIB and public and proprietary (private) Printer MIB.
  - SNMP traps to alert administrators of printer errors.
  - E-mail notification of printer errors to specified addresses.
  - Universal Plug and Play (UPnP).
  - FTP download allows users to upgrade the interface's Flash memory.

- ***DMXrfNet*** **–** a high-performance 802.11b, WiFi compatible, network interface card that enables the printer to communicate in a wireless network environment. Some of the features are listed below:

  - TCP/IP (lpd or raw TCP port), Direct Mode IPX/IP, IPX/SPX, NetBEUI, and NetBIOS/IP support
  - A PCMCIA connector for other supported 802.11b wireless devices
  - Frequency in the 2.4 GHz ISM band, with variable data rates of 11, 5.5, 2, and 1 Mbps
  - Selectable Wired Equivalent Privacy
  - Sensitivity of -91dBm at 1Mbps, -88dBm at 2Mbps, -87dBm at 5.5 Mbps, and - 84dBm at 11 Mbps; Range of 100m indoors and 300m outdoors
  - Industry standard MMCX diversity antenna connectors
  - Hot swappable 10baseT Ethernet port for wired connections
  - RS-232 compatible serial port with selectable baud rates to 230.4Kbps.
  - Datamax Web XAdmin web-browser facility including English, German, French, and Dutch multilingual capability
  - Datamax XAdmin NetWare/VINES/TCP/IP Windows-based utility
  - Console accessible via serial port, TELNET or NetWare
  - NetWare PCONSOLE, PRINTCON, PRINTDEF, NWADMIN; automatic detection of NetWare frame type, or frame type can be forced
  - Simple Network Management Protocol MIB I and II; IP or IPX
  - Multiple server firmware downloads via NetWare or TCP/IP (master mode tftp, slave mode TFTP, or BOOTP)
  - On-line Help guide; Diagnostics including protocol trace capability and crash dump
  - Multiple services per port
  - lpd-Plus virtual printer capability for complex user-defined setup and reset strings configurable on a per-service basis
  - Programmable character string conversion
  - IP security allows access restriction to the Card based on IP addresses; IP address configuration via serial port, arp, rarp, DHCP, BOOTP, Xadmin & WP-Admin utility, JetAdmin/Web JetAdmin, and NetWare; configurable TCP port numbers on a per-service basis

- ***Expanded Flash Main Card*** – an alternate main logic card with 8MB of Flash memory. This memory can be used for storing fonts, graphics, and label templates.

- ***International Language Printing Capability (ILPC)*** – an alternate font set, available for standard or expanded memory, that consists of <u>one</u> of the following:

  - CG-Times™ (European) Scaleable font (supporting the Enhanced Language Code Pages)
  - Kanji Gothic B Scaleable font
  - Simplified Chinese GB Scaleable font
  - Korean Hangul Scaleable font

- ***MCL*** – a software tool suite designed for data collection applications. Once enabled, the printer can accept input data from peripheral devices such as barcode scanners, weigh scales, and keyboards without the need of a host computer, requesting and sending data to locally resident lookup files or remote databases, enhancing communication capabilities within your system while reducing your hardware investment.

- ***Remote Display –*** a detached display assembly that features a six-foot (1.8 m) cable for convenient, remote printer control.

- ***Thermal Transfer –*** a printing method that uses ribbon to produce exceptional image clarity (as compared to most direct thermal media types). At time of order, this option must be specified for use with either 'coated side in' ribbon or 'coated side out' ribbon.

- ***Twinax/Coax Interface*** – a slide-in circuit card that provides connectivity to an AS/400 and System/3X Twinax host system or a 3270-type host system. Cable included.

1.2 Installing Printer Options

The following table lists the recommended qualification level for the installer of printer options. For detailed information concerning a specific option or the required level of expertise, contact your dealer or Datamax Technical Support.

Required Experience Level for Options Installation	
Option	**Installer**
DMXNet	DMX Certified Technician
DMXrfNet	DMX Certified Technician
MCL	DMX Certified Technician
Expanded Flash Main Card	DMX Certified Technician
Remote Display	DMX Certified Technician
Ribbon Saver	Factory Only
Thermal Transfer	DMX Certified Technician
Twinax/Coax Interface	DMX Certified Technician

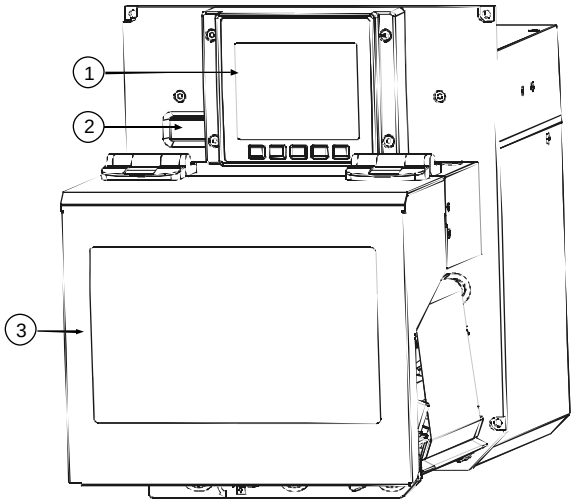
1.3 Index to Parts and Controls

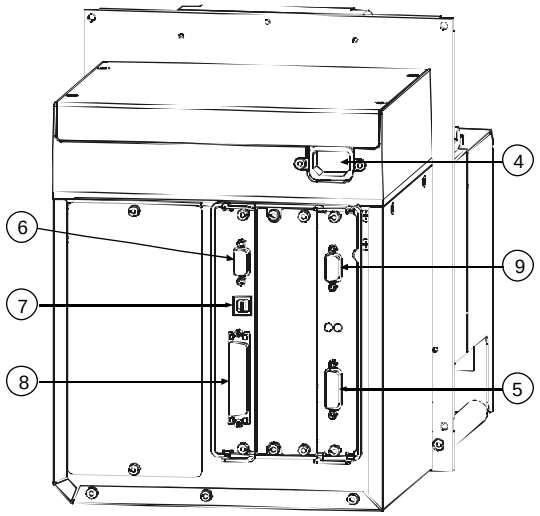
User-assessable parts and controls are highlighted in the table below. On the following pages, drawings for right and left hand models detail the location of these items. Some components are optional and, therefore, may not be included with your printer.

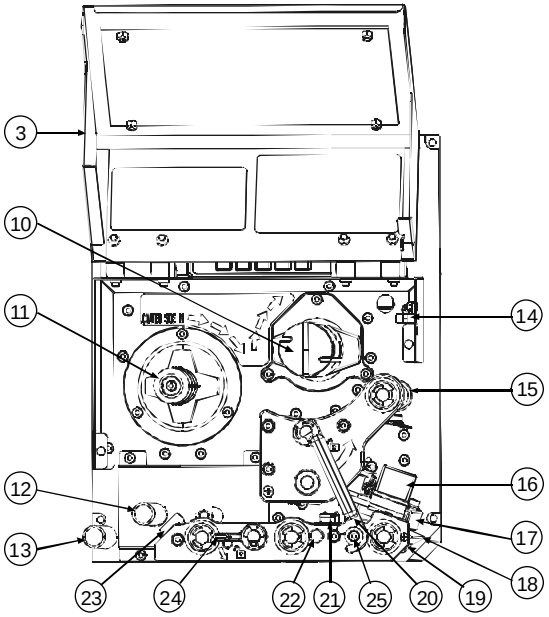
Item Number	Item Name and Related Section in this Manual
1	User Interface, Section 4
2	Power On/Off Switch, Section 3.3
3	Access Cover, Section 2.1
4	Power Receptacle, Section 3.3.4
5	GPIO Port, Section 3.3.2
6	Serial Communications Port, Section 3.3.1
7	Universal Serial Bus Communications Port, Section 3.3.1
8	Parallel Communications Port, Section 3.3.1
9	Auxiliary (Serial B) Port, Section 3.3.1
10	Ribbon Take-Up Hub, Section 3.6*
11	Ribbon Supply Hub, Section 3.6*
12	Upper Media Post, Section 3.4
13	Lower Media Post, Section 3.4
14	Cover Sensor, Section 6.2
15	Upper Ribbon Idler, Section 3.6
16	Leveling Cam, Section 5.2.1
17	Printhead Assembly, Section 5.2.2
18	Peel Bar, Section 3.2.1
19	Platen Roller, Section 5.4.2
20	Head Lift Lever, Section 3.4
21	Media Sensor, Section 3.5
22	Media Sensor Adjustment Knob, Section 3.5
23	Media Guide, Section 3.4
24	Peel Assembly Release Lever, Section 3.4
25	Locking Post, Section 3.4
26	Peel Assembly, Section 3.4

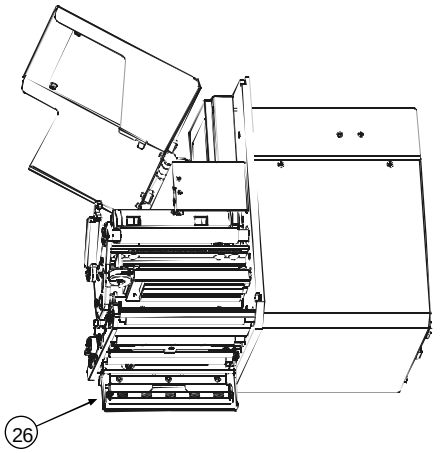
*Optional feature

1.3.1 Right Hand Models

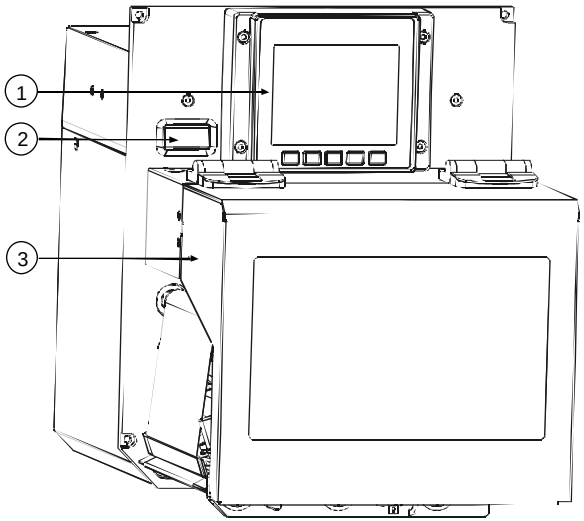


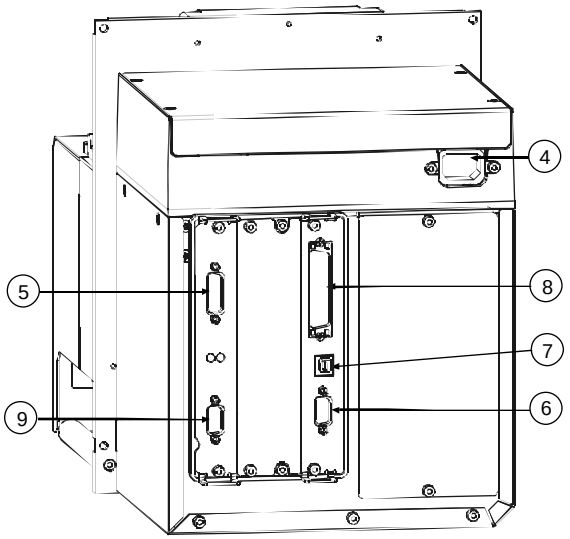


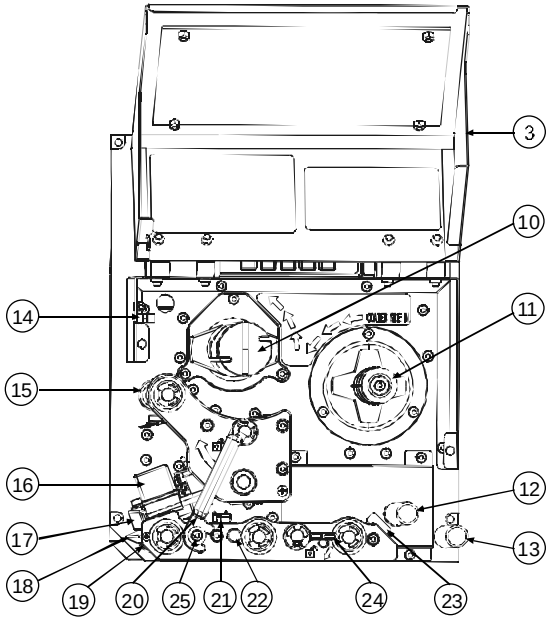


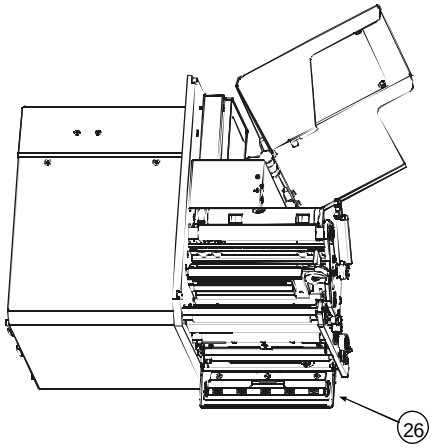


1.3.2 Left Hand Models









Getting Started

This section describes how to unpack printer, select printing supplies, and achieve the best print quality.

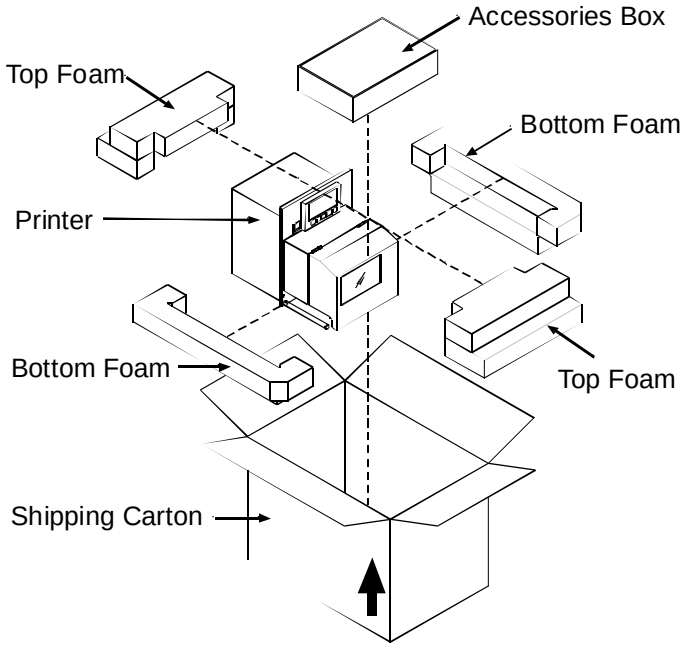
2.1 Unpacking the Printer

The printer is carefully packaged for transit. Upon arrival, inspect the shipping carton(s) for damage; if evident, immediately report the nature and extent of the damage to your freight company.

In order to operate the printer, remove all packaging material:

1. With the orientation arrow on the box pointing upward, open the Shipping Carton and remove the Top Foams and the Accessories Box.

2. Carefully lift the Printer out of the carton, and then place the Printer on a solid surface.



3. Remove the plastic bag from the Printer. Open the access cover and remove the packing material from the printhead assembly; see Section 1.3.

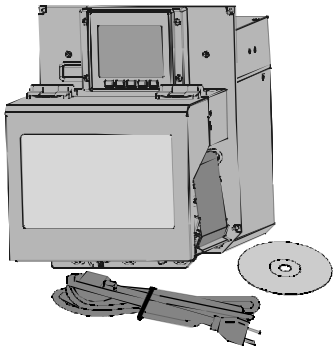
4. Lower the Head Lift Lever and close the Access Cover.

☑ ***Note:*** *Save the carton and packaging materials in the event that future shipment is required.*

2.1.1 Contents

Check the contents of the package. In addition to documentation, the following items should be present:

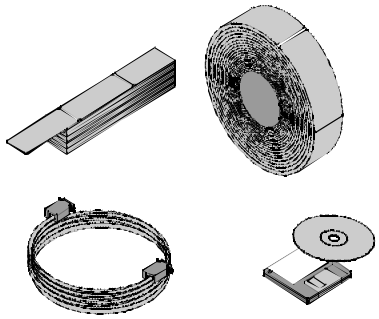
- The printer
- A power cord
- The Accessories CD-ROM
- Any special additionally purchased items or options.



2.1.2 Additional Printing Requirements

To begin label production, the following items may also be necessary.

- Media (and ribbon, if necessary); see Section 2.2.
- A communications interface cable; see Section 3.3.1.
- An applicator interface cable; see Appendix D.
- Additional labeling software (see the Accessories CD-ROM for Windows™ Drivers and basic labeling software).



2.2 Selecting Media and Ribbon

Printing supplies are a major consideration in determining the quality of the final product. Printing bar codes or detailed images on inexpensive direct thermal and thermal transfer media can be difficult. Many low-cost direct thermal stocks have raised reaction temperatures and therefore require higher heat values or slower speeds to print a clear image. In some cases, to print detailed images at high speeds, media with a low reaction or release temperature is required because the media will not be stretched beyond its limits. A brief overview of the two different media categories is included below. For information regarding a specific application always consult a qualified media specialist or a Datamax Media Representative.

Direct Thermal Media

Three important factors to consider when selecting a direct thermal stock:

- The abrasive qualities of the material that covers the thermal reactive layer of the media.
- The amount of heat required to burn an image into the media.

- The ability of the media's reactive layer to control the chemical reaction that occurs as the image is created.

Thermal Transfer Media

Three important factors to consider when selecting a thermal transfer stock:

- The combination of the label's top coating and the ribbon can affect image quality.
- A backcoating layer on the ribbon can provide printhead protection and, depending upon the formula, help reduce static build-up.
- The use of a ribbon with a slightly greater width than that of the media can help protect the printhead.

The following table is intended for reference only; for specific media application information, consult with your media specialist or a Datamax Media Representative.

Printing Supplies Overview				
Thermal Transfer Media	**Ribbon Type**	**Print Speed***	**Print Energy**	**Image Durability**
Great Label TTL™	GPR Plus™	10 – 12**	Medium	Medium
Coated and Uncoated Paper, Tag Stock, Some Films, Some Synthetics	Wax GPRPlus™	2 – 10	Low	Low
Coated and Glossy Paper, Tag Stock, Some Synthetics, Films	Wax/Resin PGR+	2 – 8	Medium	High
Synthetics, Films	Resin SDR	4 – 6	High	High
Direct Thermal Media	**Ribbon Type**	**Print Speed***	**Print Energy**	**Image Durability**
Datamax DTL-HSM Thermal Paper	N/A	10 – 12**	Medium	Low
Datamax DTL-HSH Thermal Paper	N/A	10 – 12**	Medium	Low

*Speeds given in inches per second
**Highly recommended for optimum quality at print speeds above 10 IPS.

2.3 Adjusting Print Quality

Printing flexibility is provided by a comprehensive set of print controls. Of these, the amount of print heat and the print speed will have the greatest effect.

Five settings are available to control print quality; all are accessible via the menu system:

- The first setting is the media type. Go to `MEDIA SETTINGS` → `MEDIA TYPE` (see Section 4.2.2) and select the setting that matches the media being used.

- The second setting is the heat value. Go to `PRINT CONTROL` → `HEAT` (see Section 4.2.3) and increase this value to darken the image, or reduce this value to lighten the image.

- The third setting is the speed value. Go to `PRINT CONTROL` → `PRINT SPEED` (see Section 4.2.3) and change the amount of time that the label remains under the printhead. Slower settings allow more time and control for energy transfer, while faster settings increase throughput, but may require higher heat settings to achieve the desired darkness.

- The fourth setting is the contrast value. Go to `PRINT CONTROL` → `CUSTOM ADJUSTMENTS` → `CONTRAST` (see Section 4.2.3). This is a fine-tuning adjustment, predominately affecting the gray (shaded) areas of the image.

- The final setting is the darkness value. Go to `PRINT CONTROL` → `CUSTOM ADJUSTMENTS` → `DARKNESS` (see Section 4.2.3). This is a fine-tuning adjustment, affecting the solid areas of the image.

> ☑ ***Note:*** *Heat and Speed values received by host software commands (selectable as "Heat Setting" and "Speed Setting" in most labeling programs) may override the printer's menu setting; see `HOST SETTINGS` in Section 4.2.6 for details.*

Printer Setup

This chapter explains how to mount, connect, and setup the printer.

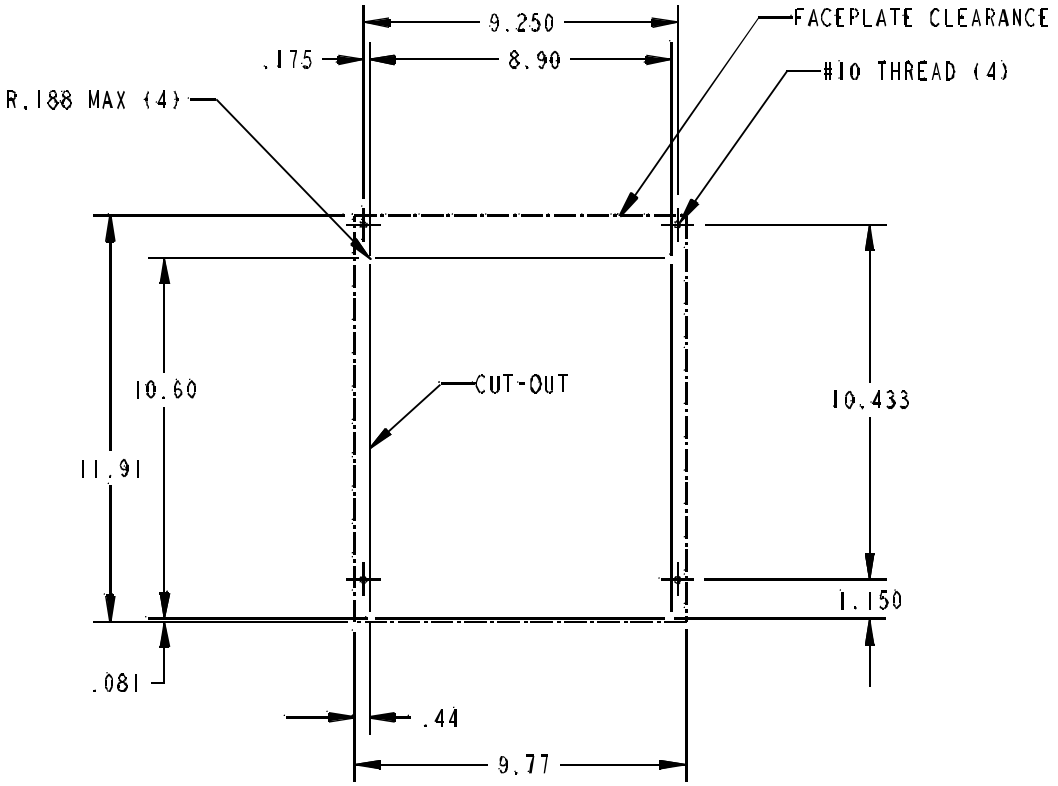
3.1 Environmental Requirements

Before installing the printer, ensure that the ambient environmental conditions of the site fall within the ranges listed in Section 7. In addition, do not install the printer in the following environments:

- Where it will be exposed to direct sunlight or other heat source.
- Where it will be exposed to liquids or excessive dust or dirt.

3.2 Mounting Requirements

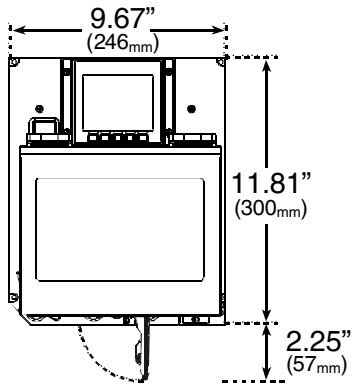
Important consideration should be given regarding the dimensions of the printer. The template below details the cutout size and hole locations required to place the printer within a support structure:



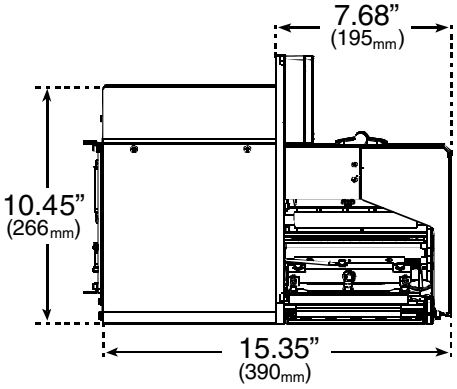
As indicated, these drawings detail other mounting considerations including clearance for the Access Cover, the Peel Assembly, and connections to the back of the printer.

Dimensions of the Four-Inch Models

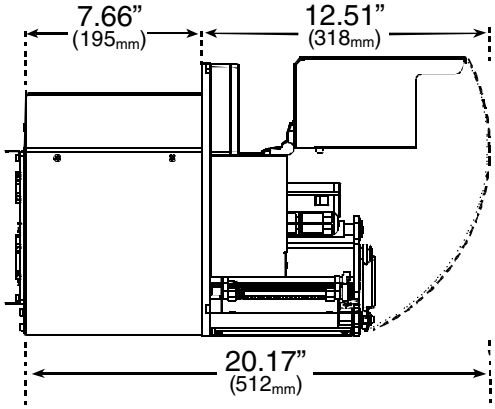
Front View, Peel Assembly – Lowered:



Side View:

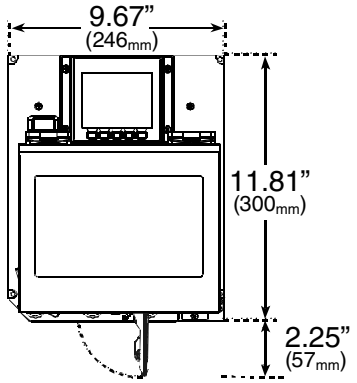


Side View, Access Cover – Raised:

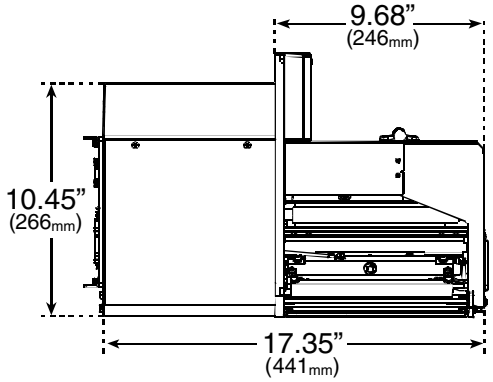


Dimensions of the Six-Inch Models

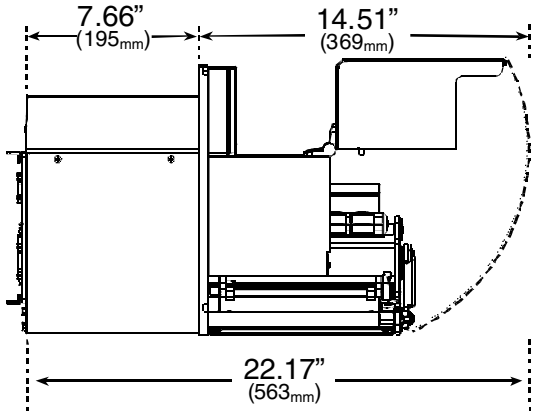
Front View, Peel Assembly – Lowered:



Side View:



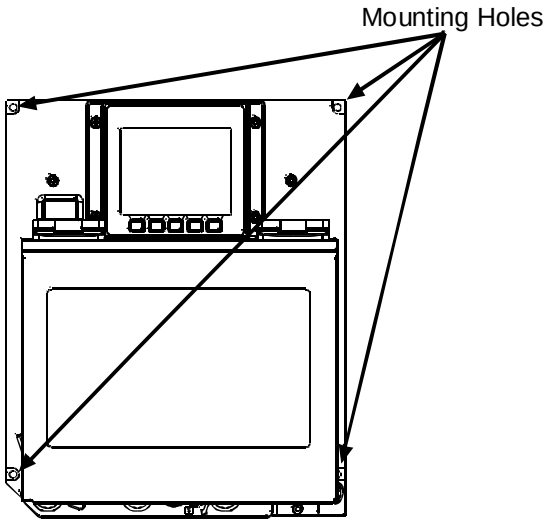
Side View, Access Cover – Raised:



When attaching the printer to the supporting framework, use #10 screws inserted at the four pre-drilled Mounting Holes.

Mount the printer as follows:

1. Align the printer's Mounting Holes to the corresponding points in the supporting framework of the applicator.



2. Hold the printer in place and insert a #10 screw in a mounting hole.

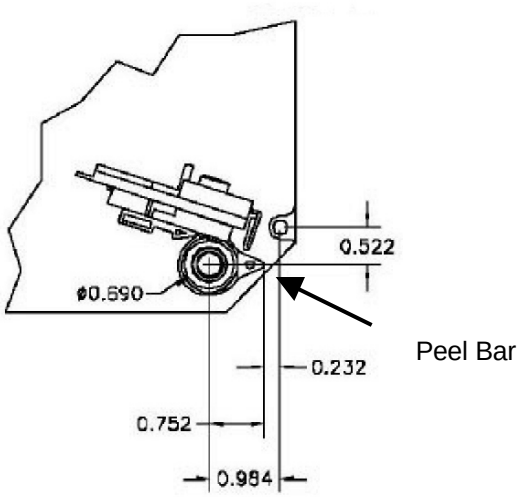
3. Start and finger-tighten the screw.

4. Start and finger-tighten the screws for the three remaining mounting holes.

5. Completely tighten all four screws.

3.2.1 Peel Point Dimension

The following dimensions detail the location of the Peel Bar. (Although this example shows a right hand model, the left hand model will have the identical dimensions.)



☑ **Note:** *Integrators switching from the PE printer, the reference dimension for the old Peel Bar location is included in Appendix C.*

3.3 Connecting the Printer

The following procedures detail the data and electrical connections to the printer.

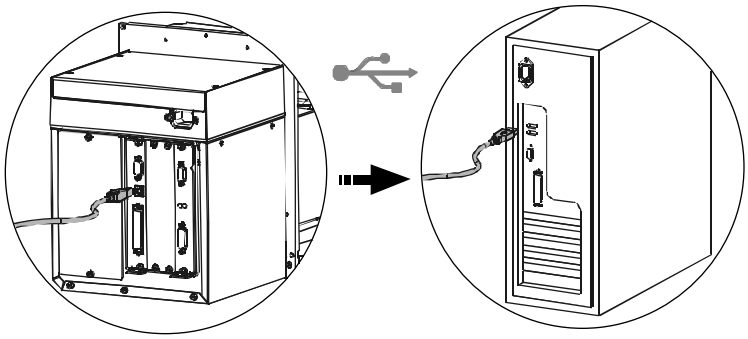
3.3.1 Communications Connections

The standard printer can be interfaced to a host via serial, USB, and parallel connections. The printer will automatically establish communications through the first port that receives valid data. Once established, the timeout period must be exceeded (ten seconds at default, see Section 4.2.6) or the printer's power must be cycled 'Off and On' to change the communication port.

☑ **Note:** *Depending upon the model, the location of the following communications connections can vary.*

3.3.1.1 USB Connections

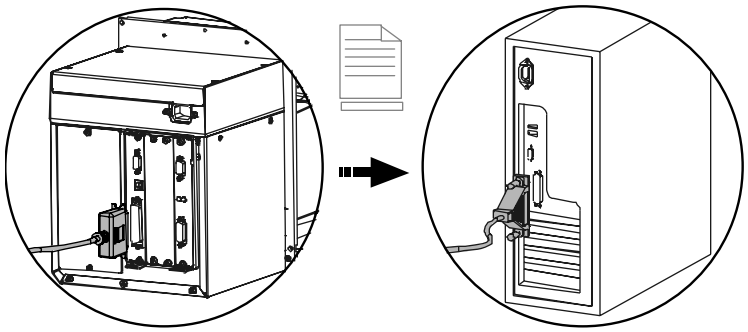
The Universal Serial Bus port, supported in Windows®95 and greater, requires a standard USB cable. (Depending upon your computer's configuration, installation may differ slightly.)



WARNING *This USB Port is a device-end only connection. Never attach a keyboard, mouse, modem, etc. to this port. Damage can result.*

3.3.1.2 Parallel Port Connections

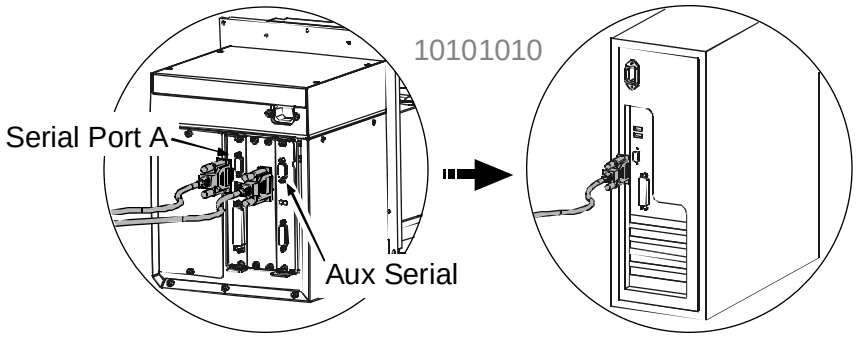
The parallel interface requires a Centronics® IEEE 1284 cable with a 36 pin male connector. Bi-directional mode is IEEE 1284 Compliant, using forward and reverse channel communications. In this mode, data can be sent to the host provided it is also IEEE 1284 Compliant and has supporting software.



3.3.1.3 Serial Port Connections

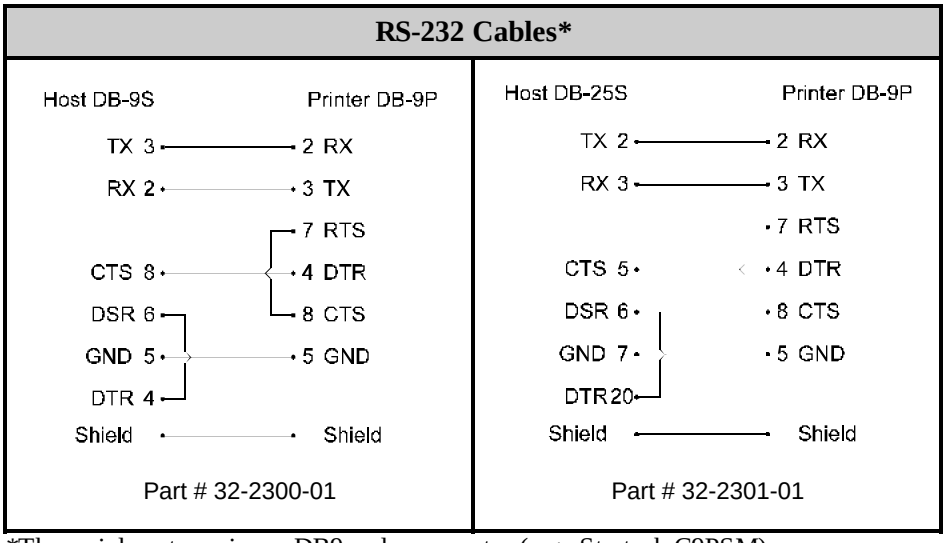
The serial interface (Serial Port A) on the main logic card supports RS-232C and RS-422/RS-485 communications. The Aux Serial, J1 on the Applicator Interface Card, supports RS-232C only (see Appendix D for details).

Serial port settings for baud rate, word length, word parity, stop bits, and handshaking protocol are menu-selectable and must be configured to match the host's port settings; see Section 4.2.6.



The available serial cables and part numbers are shown below. **For proper data exchange, the serial interface cable requires specific pin-outs (see diagram).** Contact a reseller for ordering information.

Serial Port Pin Number	RS-232 (Serial Port A and B) Function	RS-422 & RS-485 (Serial Port A, only) Function
1	+5V (@ .5 amps)	---
2	RX	RXD +
3	TX	TXD –
4	DTR	RXD –
5	Ground	Ground
6	---	---
7	RTS	RTS
8	CTS	CTS
9	---	TXD +



*The serial port requires a DB9 male connector (e.g., Startech C9PSM).

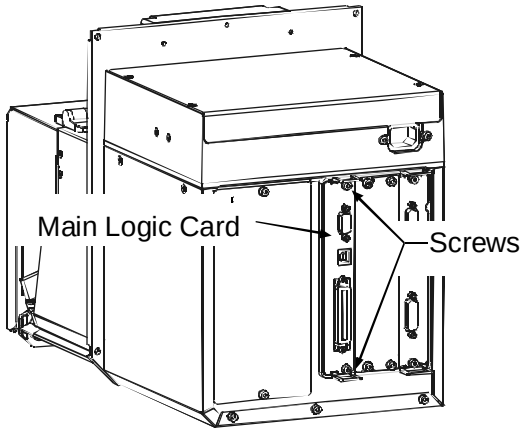
3.3.1.3.1 RS-422/485 Communications

To use RS-422/485 communications, the main logic card must be reconfigured, as described below:

CAUTION *Always wear a wrist strap and follow standard ESD prevention measures when handling the Main Logic Card.*

1. Turn 'Off' the power switch, unplug the AC Power Cord from the printer, and remove any interface cable(s) already attached to the Main Logic Card.

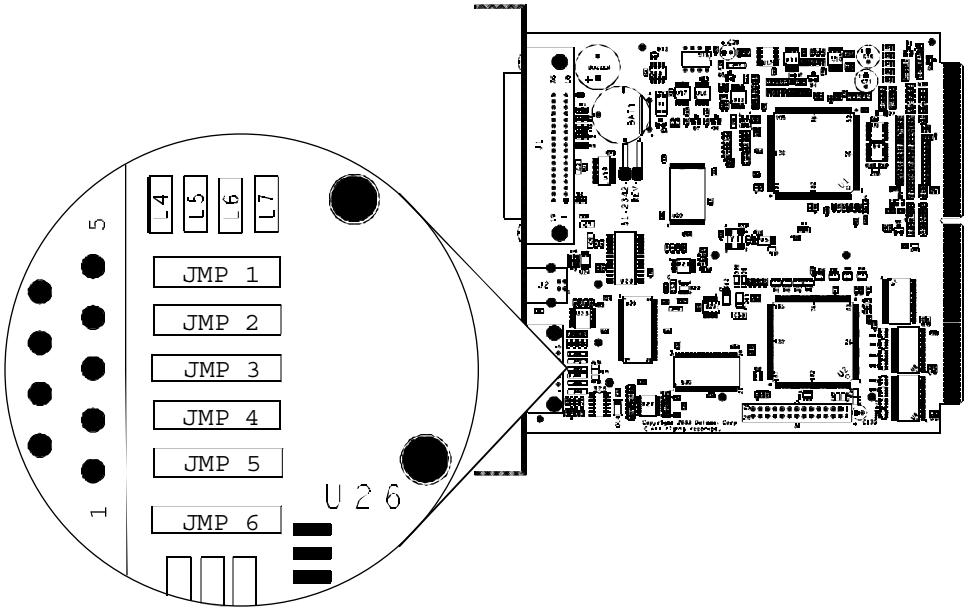
2. Remove the two Screws securing the Main Logic Card to the printer. Slide the card out of the printer and place it on a static free work area.



☑ ***Note:*** *Depending upon the model of printer, the location of the Main Logic Card can vary.*

3. On the Main Logic Card, remove the jumpers placed across JMP1, JMP2, JMP3, JMP4, JMP5, and JMP6.

4. Slide the Main Logic Card back into the printer and secure it using the screws removed earlier.

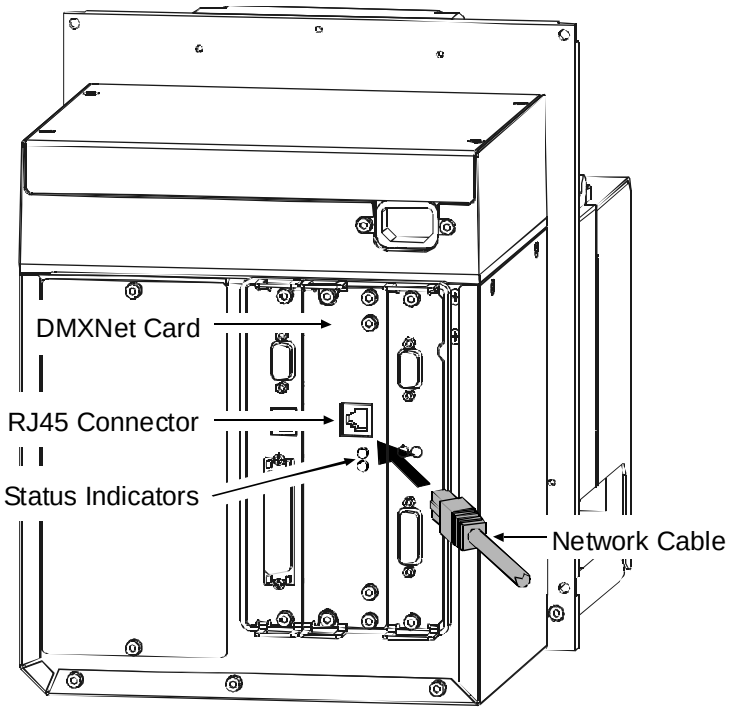


5. Connect an RS-422/485 interface cable to Serial Port A (see the table in Section 3.3.1.3 for details).

6. Plug in and turn ‘On’ the printer. Configure the port communication settings to match that of the host.

3.3.1.4 DMXNet Connections

The DMXNet option has several menu-selectable modes, as detailed under '`NIC ADAPTER`' in Section 4.2.6. For detailed installation, configuration, and operational instructions, refer to the *DMXNet Resource Manual*, provided with the option. Use the following universal Ethernet 8-wire standard when configuring your 10/100BaseT cables for the DMXNet Card. Depending on the length, the cable should be Category/Type 3 or better.



RJ45 Pin Number	Ethernet
1	Transmit +
2	Transmit –
3	Receive +
4	–
5	–
6	Receive –
8	–
7	–
8	–

The Status Indicators (LEDs), viewable from the back of the printer, provide a quick operational check of the interface, as defined below:

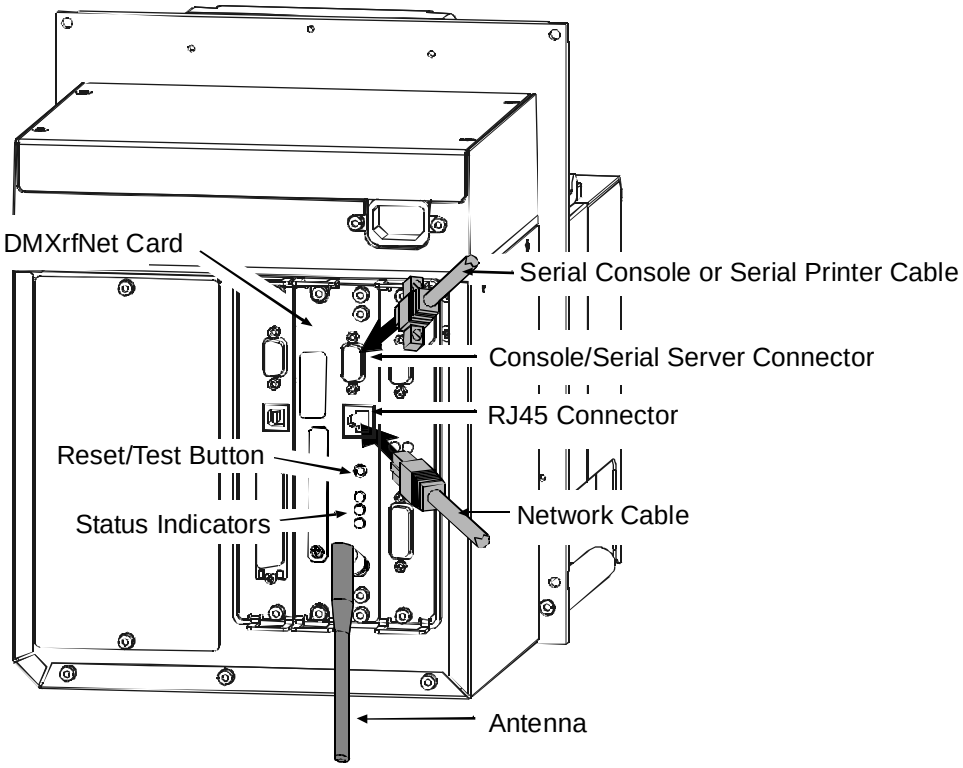
> ☑ ***Note:*** *After power-up, wait until '`DMXNET INITIALIZING`' is no longer displayed (about two minutes) before proceeding.*

Status Indicator	Normal Conditions	Other Conditions
Green	Upon power-up, this LED is 'On' to indicate that the card is performing self-tests, afterward the LED flashes and may flash again as soon as the printer's initialization is complete. This LED may also be 'On' when awaiting a print job.	One to seven blinks of the Amber LED -- followed by one to twelve blinks of the Green LED indicates a hardware failure.
Amber	Generally indicates job activity. When receiving print jobs over the network, the LED flashes; it remains 'Off' during inactivity.	

3.3.1.5 DMXrfNet Connections

The DMXrfNet option has several menu-selectable modes, as detailed under '`NIC ADAPTER`' in Section 4.2.6. Depending upon the method you select to configure the DMXrfNet card, you may need a hard wire connection. In addition, a hard wire connection is necessary if you plan to use the 10 BaseT port or the Serial Server in your application.

The drawing below illustrates the available mode-dependant connections to the DMXrfNet Card. For detailed installation, configuration, and operational instructions, refer to the *DMXrfNet Resource Manual*, provided with the option.



Status Indicators	Normal Conditions
Wireless	This red indicator initially comes 'On' and then cycles 'Off' when power is applied to the printer. Thereafter, 'On' denotes that a wireless link is established.
ACT/Err	This green indicator blinks during network activity.
LNK	This yellow indicator initially comes 'On' and then goes Off' when power is applied to the printer. Thereafter, 'On' denotes that a 10 BaseT Ethernet connection is established.

The **Reset/Test Button** is a multi-function switch with the following functions:

(1) When pressed momentarily, this produces a printout of the DMXrfNet Card's current settings.

(2) When pressed and held for five seconds, this resets the DMXrfNet Card to the factory default parameters. (The default password is **`access`**)

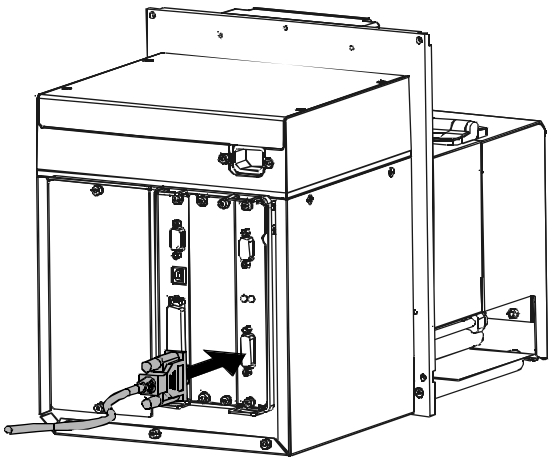
(3) When pressed and held during printer power-up, this causes the DMXrfNet Card to assume Ad-Hoc mode on WiFi Channel 11 with the Service Set Identifier (SSID) of **`printer`**. (This also restores Console mode.)

3.3.2 Applicator Connections

After setting up the GPIO Port per the instructions found in Appendix D, connect the applicator cable to the GPIO Port (J2) on the Applicator Interface Card:

WARNING *Failure to properly configure the GPIO Port may result in damage to the printer and / or the applicator.*

☑ ***Note:*** *Integrators switching from the PE printer, an adapter cable (part number 32-2562-01) is available for the GPIO Port connection. Pin-out details of this cable are included in Appendix C.*

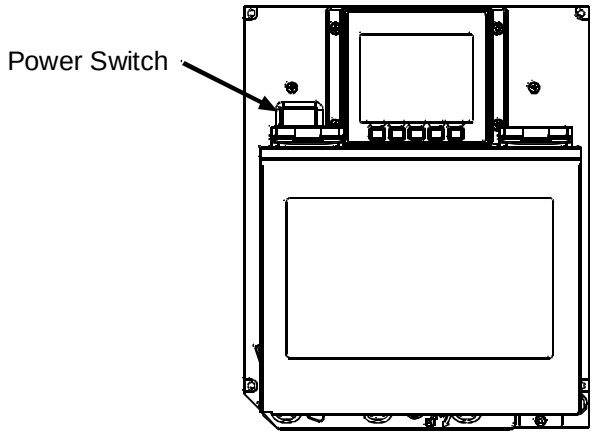


3.3.3 Power Connections

The AC power connection is made via the receptacle on the back of the printer. The printer's power supply is auto ranging; for the acceptable voltage ranges, see Section 7. Make electrical connections and power-up the printer as follows:

1. Ensure that AC power to the host computer and applicator system is 'Off'.

2. Ensure that the printer's Power Switch is in the 'Off' position.



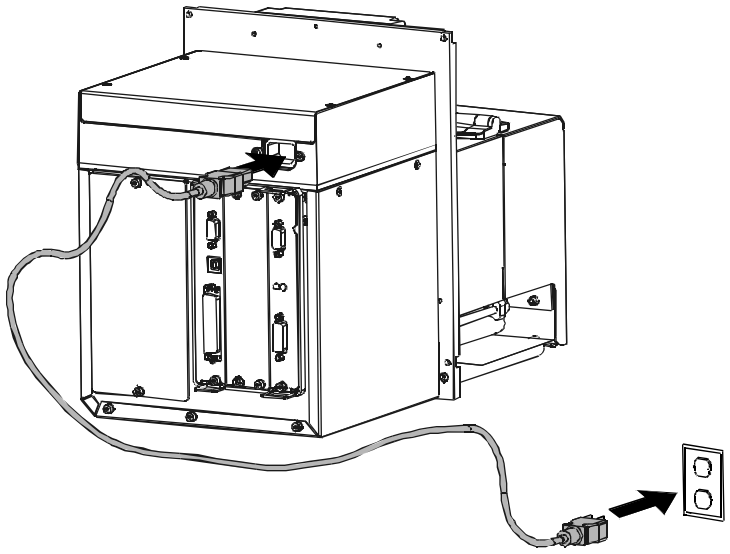
3. Ensure that the appropriate communications cable is connected from the host to the printer; see Section 3.3.1.

4. If additional serial communications are needed, ensure that a serial cable is connected from the host to the Aux Serial Port (J1) on the Applicator Interface Card; see Section 3.3.1 for details.

5. Ensure that the applicator cable is connected to the GPIO Port; see Section 3.3.2 for details.

WARNING *Failure to properly configure the GPIO Port may result in damage to the printer and / or the applicator.*

6. Connect the AC Power Cord to the printer, and then plug the AC Power Cord into a properly grounded outlet.



7. Turn ‘On’ the host computer, the applicator system, and then the printer.

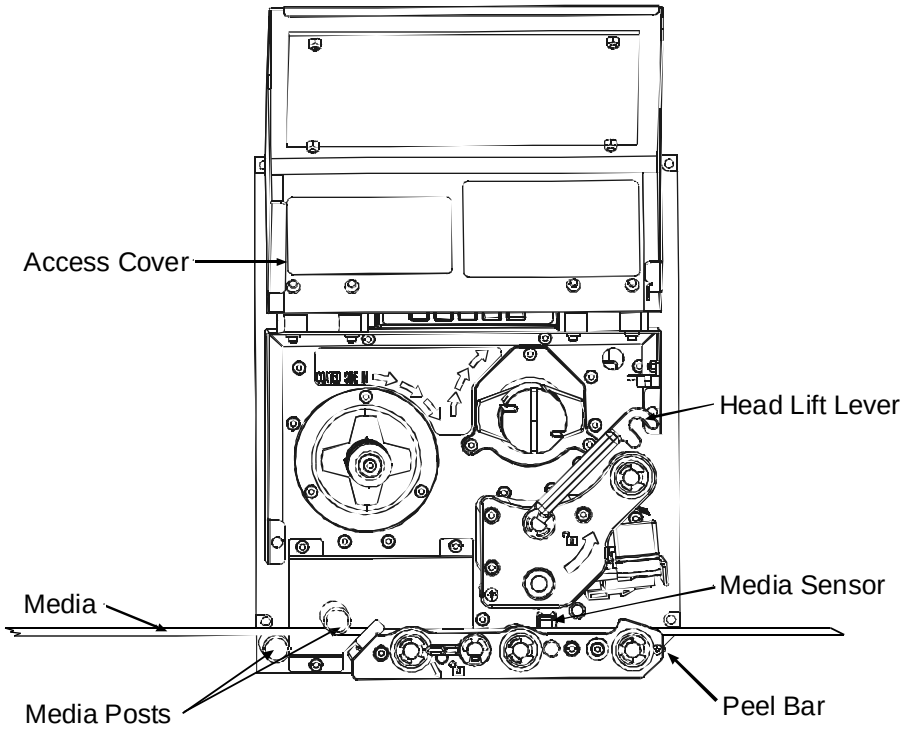
3.4 Loading Media

> ☑ **Note:** *At default settings, a Buzzer will sound when the Access Cover is raised. To disable this function see Section 4.2.5,* `System Settings → Buzzer`.

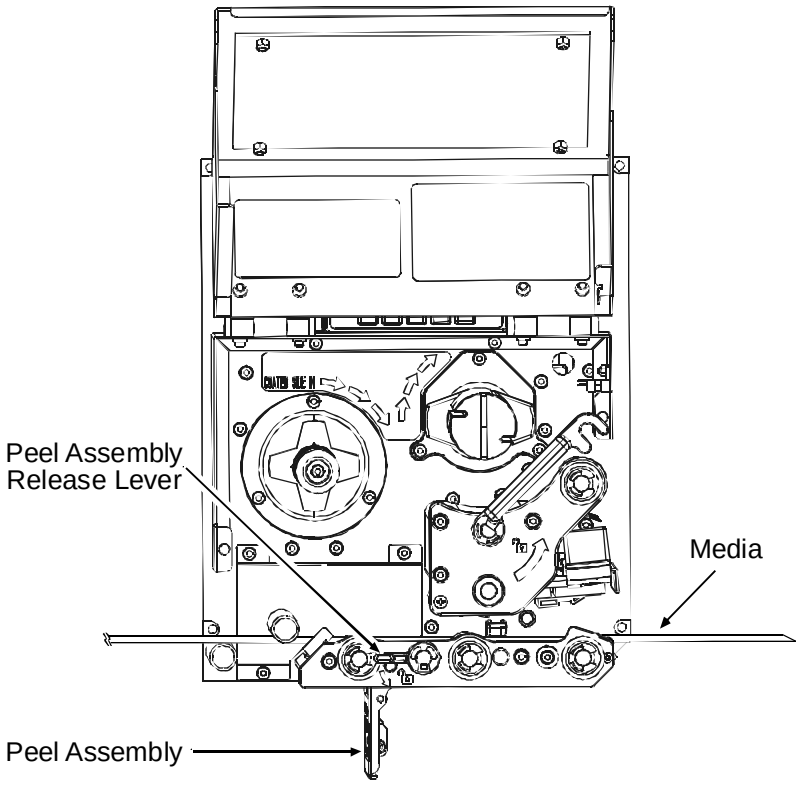
Load media as follows:

1. Open the Access Cover and raise the Head Lift Lever.

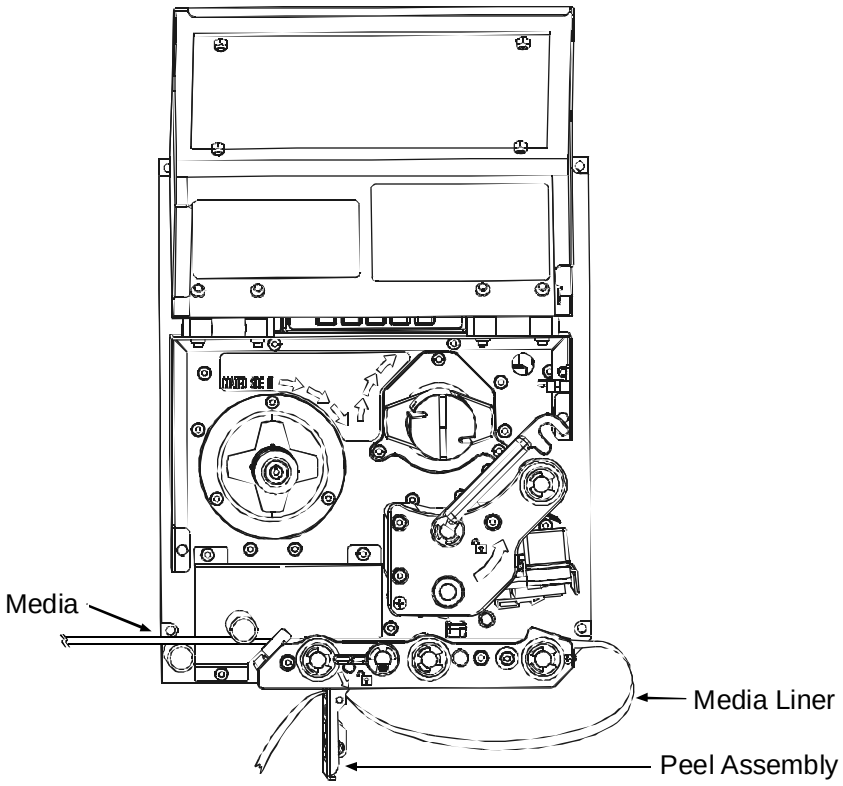
2. Route the Media between the Media Posts, through the Media Sensor, over the Peel Bar, and out of the printer, as shown below.

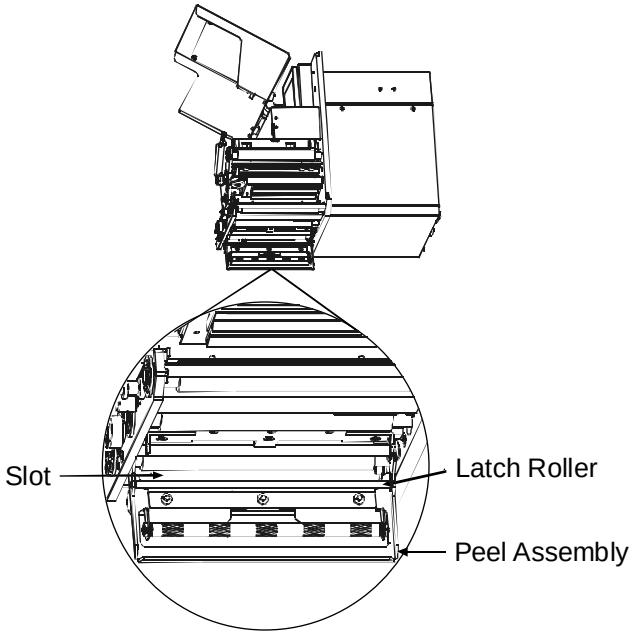


3. To automatically peel die-cut labels after printing, press down on the Peel Assembly Release Lever to lower the Peel Assembly; otherwise, proceed directly to Step 6.

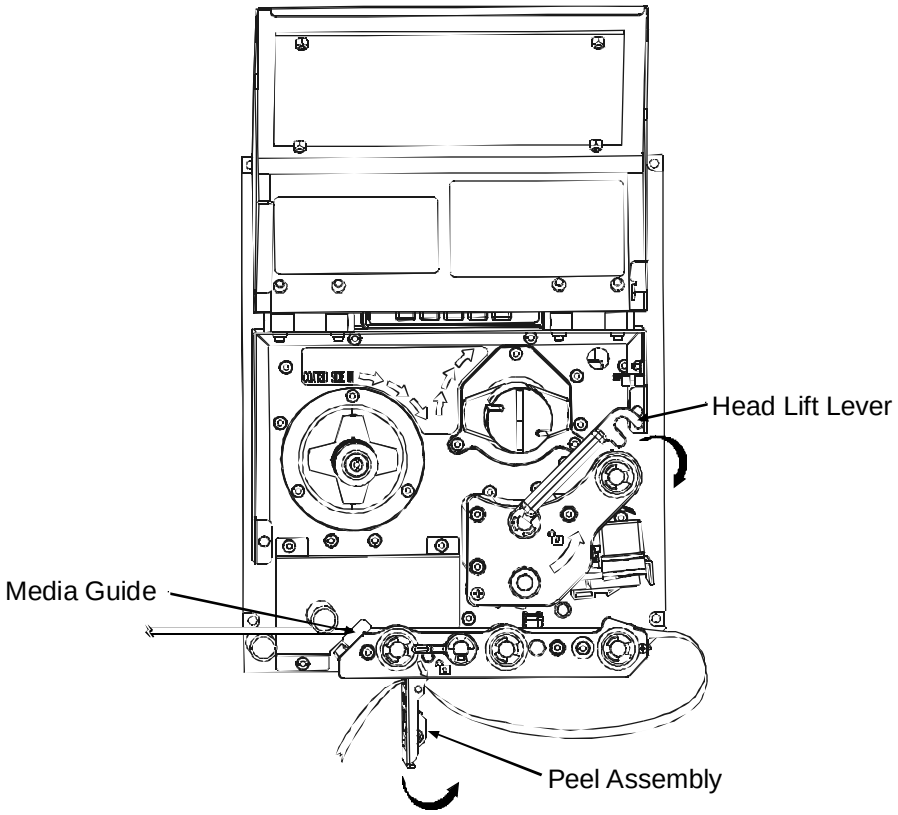


4. Pull approximately 12 inches (30 cm) of media out the front of the printer then remove all of the labels from this length of Media Liner. Route the Media Liner down to the Peel Assembly, over the Latch Roller, and through the Slot.

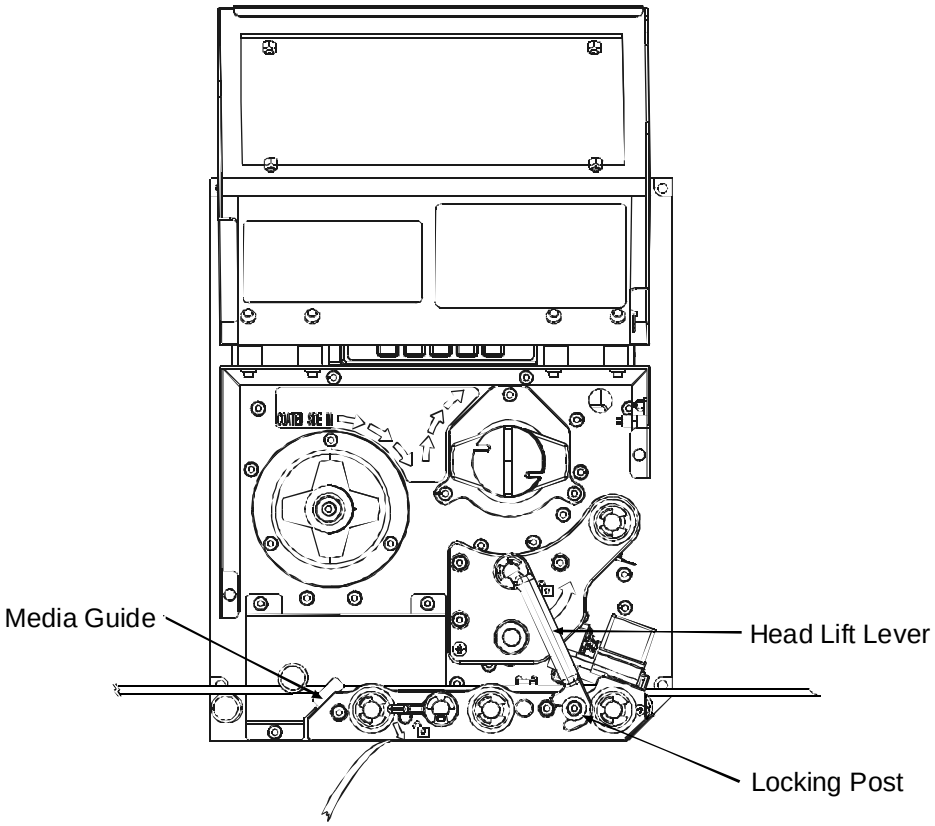




5. Pull the Media Liner through the Slot in the Peel Assembly until all slack is removed. Lifting from the center, raise the Peel Assembly until it locks into place.



6. Position the Media Guide lightly against the side of the media.



7. Adjust the Media Sensor over the labels (see Section 3.5).

8. If printing on thermal transfer media, load ribbon (see Section 3.6); otherwise go to Step 9.

9. Lower the Head Lift Lever until it is completely and securely engaged onto the Locking Post.

10. If loading media for the first time, or changing to a different media type or size, perform a Quick Calibration:

    With the printer powered 'On,' press and hold the FEED Key until at least two labels have been output (see Section 5.1.1 for details).

11. Adjust the Leveling Cam (see Section 5.2.1).

3.5 Adjusting the Media Sensor

The Media Sensor detects labels. Position the Media Sensor as follows:

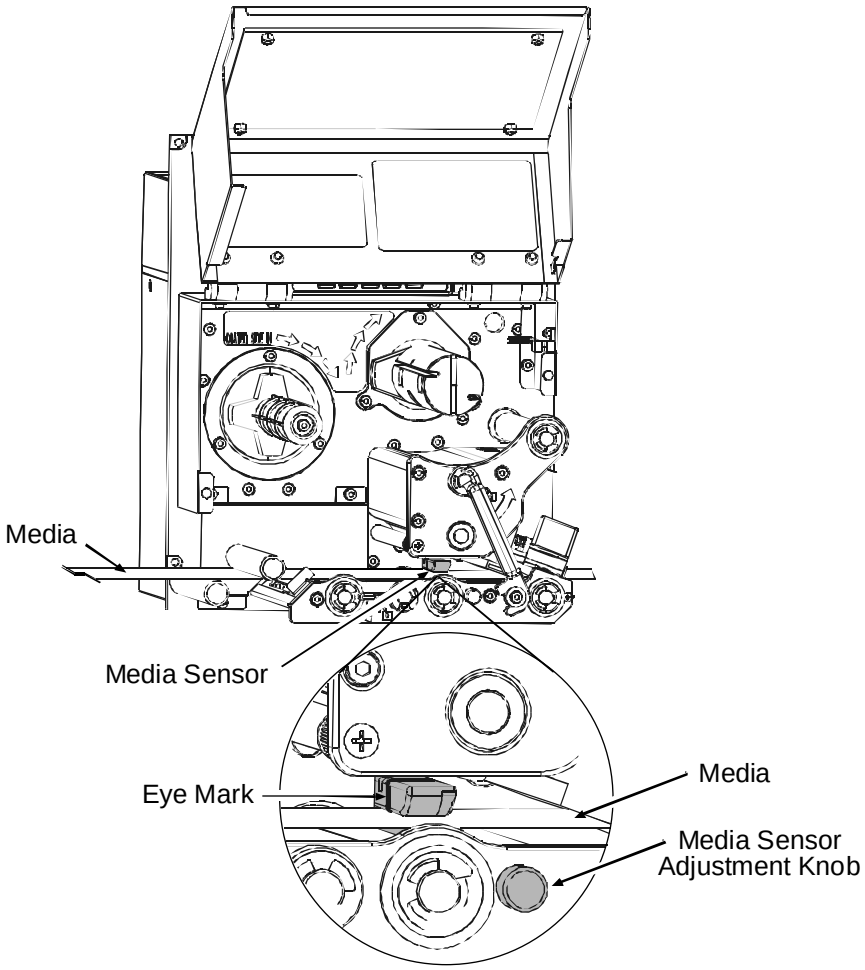
1. Load media, ensuring that the media is routed through the Media Sensor, as described in Section 3.4.

2. Depending on the type of media being used, rotate the Media Sensor Adjustment Knob until the Eye Mark on the Media Sensor is positioned according to the table below.

> ☑ **Note:** *The printer defaults to the 'Gap' Sensor Type for use with die-cut and notched media. If using a different media, change the Sensor Type. Use your software program, or see Section 4.2.2 for menu details.*

Media Sensor Adjustment and Sensor Type Selection		
Media Type	**Eye Mark Position**	**Sensor Type Required**
Die-cut	Centered over the label	Gap
Notched	Centered over the notch	Gap
Reflective	Centered over the black mark	Reflective
Continuous	Near the middle of the media	Continuous *

* See Section 4.2.2 for the information on the Label Length setting.



3.6 Loading Ribbon

To print with thermal transfer media, ribbon is required. The Ribbon Hub configuration will determine the ribbon type (ink wound 'in' or 'out') that can be used in the printer. The directional arrows on the Ribbon Loading Label indicate the way to route the ribbon through the printer.

> ☞ *Always use ribbon that is slightly wider than the media (and liner, if any) to protect against printhead wear. Ribbon types are available with the coated (ink) layer wound 'in' or 'out.' These are NOT interchangeable for use with the printer.*

Load ribbon into the printer as follows:

1. With the access cover open and the Head Lift Lever raised, position a ribbon to be dispensed in the direction appropriate for the Ribbon Supply Hub, as indicated in the figures below.

2. Slide a roll of ribbon on the Ribbon Supply Hub until it rests against the hub's flange.

3. Route the ribbon under the Lower Idler, out the front of the printer, over the Ribbon Shield and Upper Idler, then up around to the Ribbon Take-Up Hub.

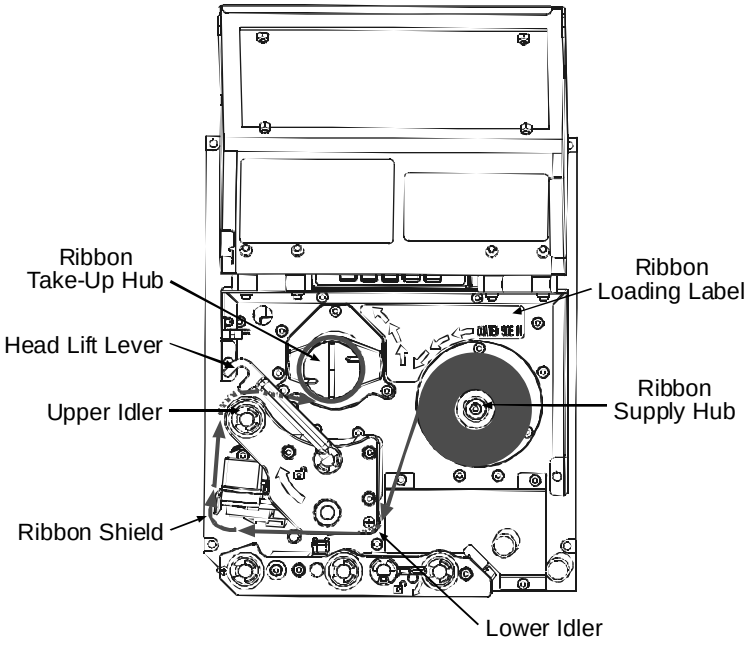
4. Place the ribbon on the Ribbon Supply Hub then turn the hub several times in the direction of take-up (see arrows on the Ribbon Loading Label) to secure the ribbon.

5. Lower the Head Lift Lever back into the locked position. Close the access cover.

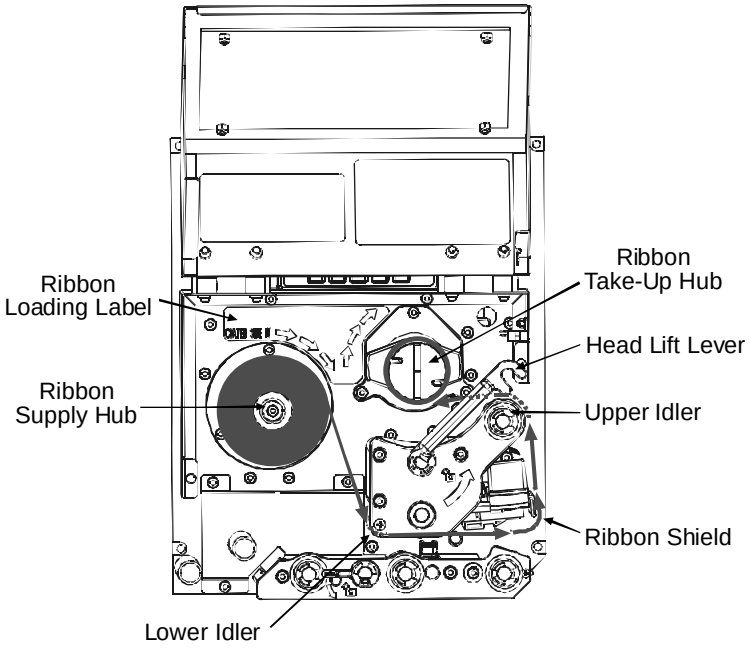
3.6.1 Removing Ribbon

When the ribbon supply is exhausted, grasp the used ribbon on the Ribbon Take-Up Hub, then while pulling outward, squeeze together the collapsible hub and pull off the ribbon. Next, pull the empty core from the Ribbon Supply Hub and discard it.

‘Coated Side In’ Ribbon Routing Diagrams

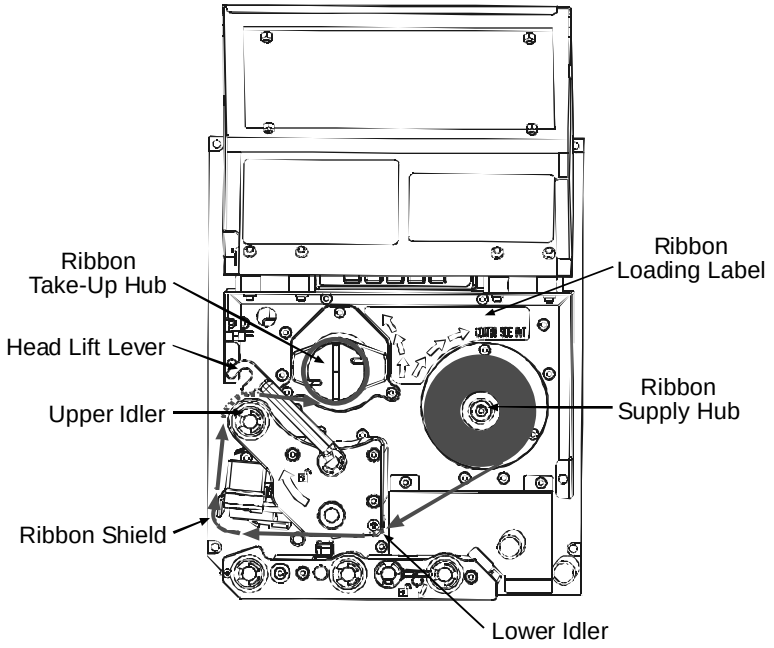


Left-Hand Model - CSI

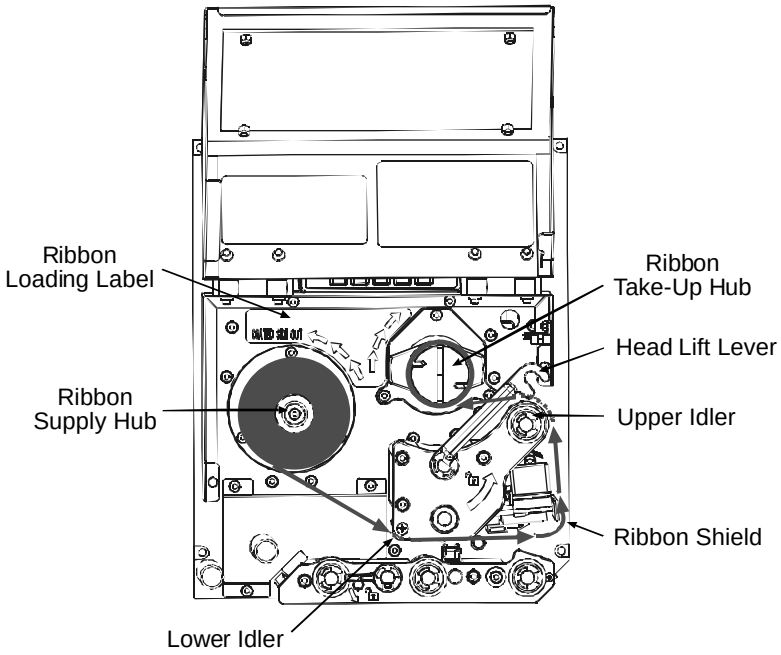


Right-Hand Model -CSI

‘Coated Side Out’ Ribbon Routing Diagrams



Left-Hand Model - CSO



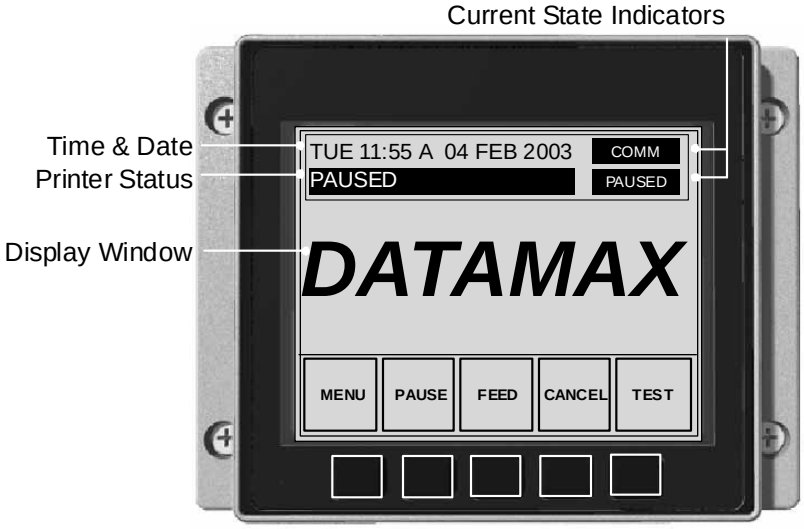
Right-Hand Model - CSO

The User Interface

The user interface is comprised of a graphic display and soft-function keys. Its operation is mode-dependant, so depending upon your selections the displayed items and key functions of the interface can change. All of the various modes are detailed in this section.

4.1 User Interface Functions

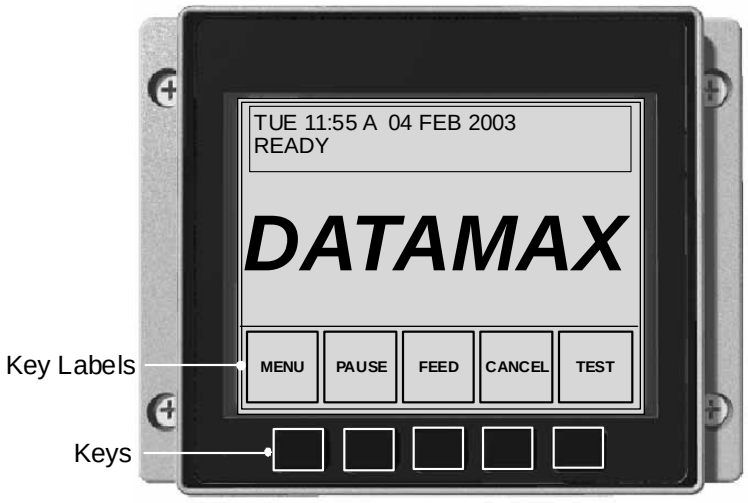
The graphic display is a window into printer operations, providing the following information:



Indicator	Indicator Item and Function
Current State	Provides two types of information: ➢ COMM indicates data is being received and processed. ➢ PAUSE indicates the printer is in a 'Paused' condition.
Time & Date	The current settings for Time and Date.
Printer Status	Following initialization, the 'Ready' message and a label counter during a batch print job, but also any prompt, condition, warning, or fault message.
Display Window	Provides several types of information: ➢ A start-up graphic (see the *Class Series Programmer's Manual* for details). ➢ The Menu Window when in Menu Mode. ➢ The Test Window when in Test Mode. ➢ The FAULT message during a printer fault condition.

4.1.1 Ready Mode

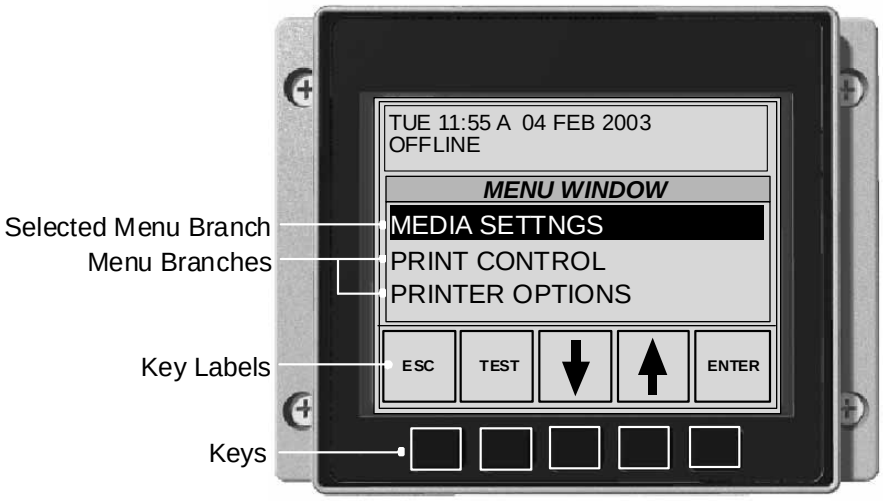
In Ready Mode, the printer is idle, waiting to accept data for label printing.



Key Label	Key and Function
MENU	The MENU Key takes the printer Offline and enters Menu Mode. (When shaded, this denotes that security is enabled and now a password must be entered. See Section 4.2.1.) ☑ **Note:** *While in Ready Mode, pressing and holding this key will adjust the display contrast. It can take up to fifteen seconds to cycle through the entire contrast range.*
PAUSE	The PAUSE Key temporarily suspends printing, as noted by the Current State Indicators. Pressing the key again will return the printer to normal operation.
FEED	The FEED Key advances one label, and clears any corrected faults. Also, pressing and holding this key causes the printer to perform a Quick Media Calibration; see Section 5.5.1.
CANCEL	The CANCEL Key 'pauses' the printer and then prompts you for confirmation. If yes, the current job is cancelled. The printer remains paused. Also, pressing and holding this key four seconds will reset the printer and clear temporary host settings; see Section 6.4.1.
TEST	The TEST Key enters the Test Mode; see Section 4.1.3. Pressing and holding this key evokes the printhead cleaning routine; see Section 5.4.1. (When missing, this denotes that security has been enabled; a password must be input to proceed. See Section 4.2.1.)

4.1.2 Menu Mode

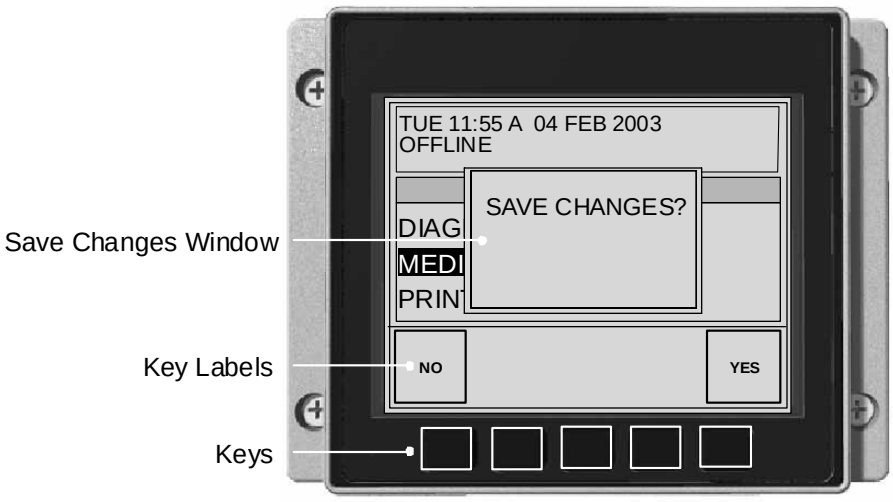
In Menu Mode, the Menu Window appears. This mode allows the printer to be configured for your application. Note that the Selected Menu Branch appears highlighted in a reverse field on the Menu Window.



Key Label	Key and Function
ESC	The ESCAPE Key exits the Selected Menu Branch. Repeatedly pressing the key exits Menu Mode and returns the printer to Ready Mode.
TEST	The TEST Key enters the Test Mode; see Section 4.1.3. Pressing and holding this key causes the printer to perform a printhead cleaning; see Section 5.4.1.
↓	The DOWN ARROW Key selects the previous Menu Branch. (Not all branches appear in the Menu Window at any one time.)
↑	The UP ARROW Key selects the next Menu Branch. (Not all branches appear in the Menu Window at any one time.)
ENTER	The ENTER Key enters the Selected Menu Branch.

4.1.2.1 Save Changes Window

Changing settings and then exiting Menu Mode evokes the Save Changes Window. This window allows the changes made to the Menu System to be saved or discarded (see Section 4.2.1).

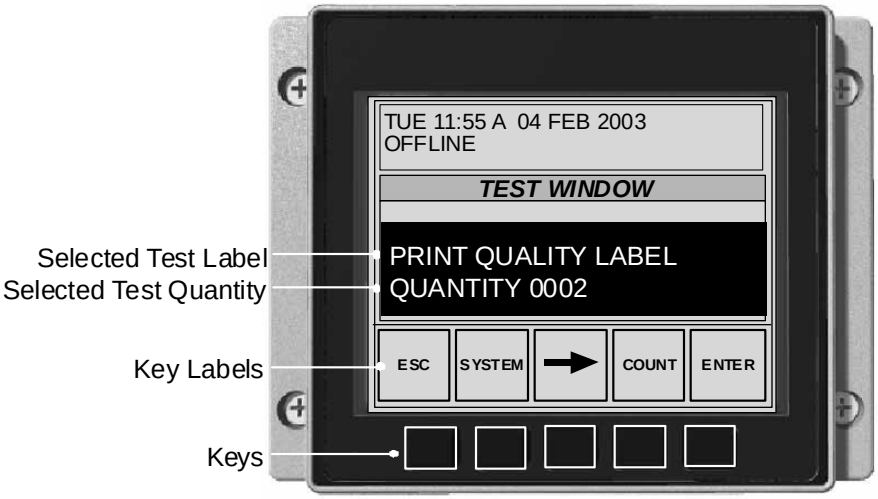


Key Label	Key and Function
NO	The NO Key exits Menu Mode without saving the changes that have been made to the printer's operating parameters.
YES	The YES Key saves the changes that have been made to the printer's operating parameters and then exits Menu Mode.

4.1.3 Test Mode

In Test Mode, the Test Window appears. This mode allows various sample and informational labels to be produced.

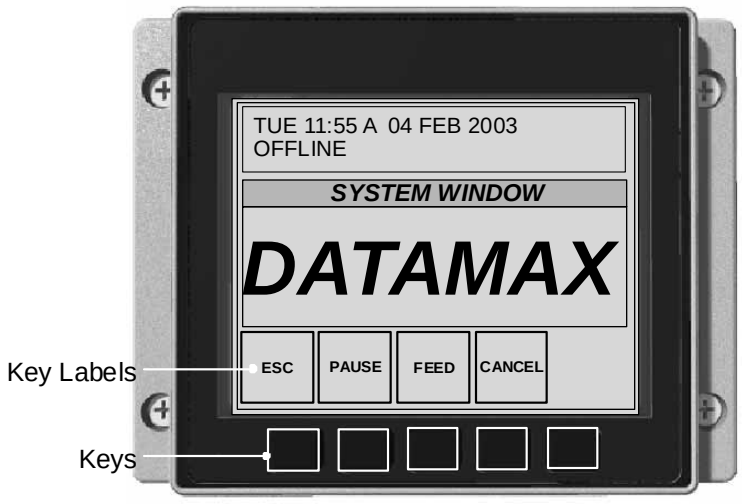
> ☑ **Note:** *Test functions are disabled when the printer is processing data received from a communications port. Also, when 'SECURITY' is enabled this function is not accessible until the correct password is input.*



Key Label	Key and Function
ESC	The ESCAPE Key exits Test Mode and returns to Menu Mode.
SYSTEM	The SYSTEM Key evokes a System Window with the following functions: ESC, PAUSE, FEED, and CANCEL; see Section 4.1.3.1.
→	The RIGHT ARROW Key changes the Selected Test Label; see Section 4.4.
COUNT	The COUNT Key changes the Selected Test Quantity of labels in the following amounts: 1, 10, 100, 1000, and 9999 (except the 'Configuration Label', which is always one). Pressing and holding this key scrolls the quantities.
ENTER	The ENTER Key will print the Selected Test Label at the Selected Test Quantity.
	☞ *A printing time delay can be specified for this function using 'Print Test Rate'; see Section 4.2.7.*

4.1.3.1 Test Mode System Window

Pressing the System Key while in Test Mode evokes a System Window. This window allows the user to perform PAUSE, FEED, and CANCEL operations while in Test Mode.

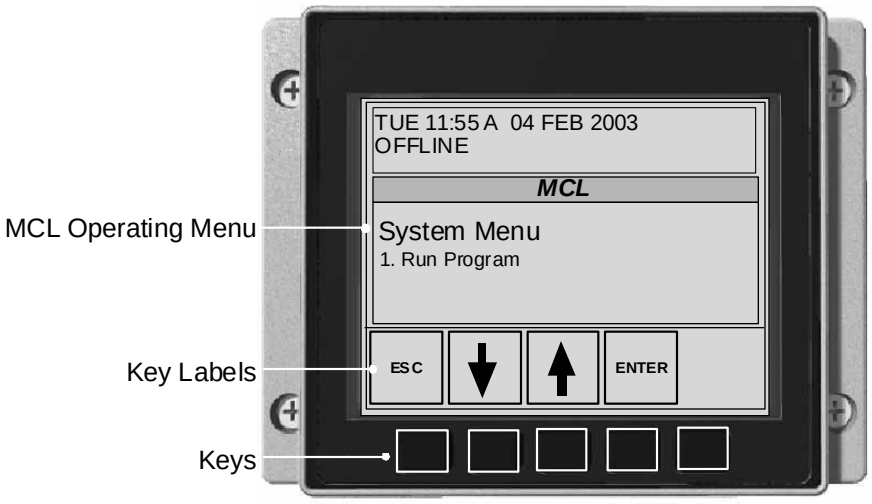


Key Label	Key and Function
ESC	The ESCAPE Key closes the System Window and returns to Test Mode.
PAUSE	The PAUSE Key temporarily suspends printing, as noted by the Current State Indicators. Pressing the key again will return the printer to normal operation.
FEED	The FEED Key advances one label, and clears any corrected faults. Also, pressing and holding this key causes the printer to perform a Quick Media Calibration; see Section 5.1.1.
CANCEL	The CANCEL Key 'pauses' the printer and then prompts you for confirmation. If yes, the current job is cancelled. The printer remains paused. Also, pressing and holding this key four seconds will reset the printer and clear temporary host settings; see Section 6.4.1.

4.1.4 MCL Mode

Enabling MCL Mode in the Menu system executes the MCL application. This mode allows the printer to accept input data from peripheral devices such as barcode scanners, weigh scales, and keyboards without the need of a host computer. This printer-resident application can also request and send data to locally resident lookup files or remote databases.

> ☑ **Note:** *The MCL program is a custom application that has been developed by your MCL Certified provider. Consult your provider for details regarding operation and support.*



Key Label	Key and Function
ESC	The ESCAPE Key has program dependent operation, and typically returns to the previous menu level.
↓	The DOWN ARROW Key has program dependent operation, and typically selects the next menu item.
↑	The UP ARROW Key has program dependent operation, and typically selects the previous menu item.
ENTER	The ENTER Key has program dependent operation, and typically selects the current menu item or function.

4.2 The Menu System

Printer operation can be controlled through the user interface from the following six menu system branches:

- Media Settings
- Print Control
- Printer Options
- System Settings
- Communications
- Diagnostics

While in the menu system, the current selection will be indicated with an asterisk (*) next to the displayed item. Selections designated with a section symbol (§) will require a printer reset before becoming effective. A reset will be automatically invoked when exiting the menu system and answering 'Yes' to the 'Save Changes' prompt. Changes made will be saved. When power is removed, the new settings will be restored upon power-up.

The same functional commands from your host computer may, in some cases, override the printer's menu settings. In addition, the menu system has a password protection feature to prevent accidental or unauthorized parameter changes; see Section 4.2.5: System Settings / Security for details.

☑ **Notes:** *(1) In the following subsections, the factory default settings are denoted with the '✧' symbol. Selections denoted with a diamond (♦) can only be changed through the menu system – all other selections can be overridden by host software commands. Consult the Class Series Programmer's Manual for specific information.*

(2) For PE users converting to the A-Class, a Menu Constraint Cross-Reference, which details the differences between the printer menu items and functions, has been included in Appendix C.

4.2.1 Entrance and Exit Prompts

To change the setup parameters of the printer via the User Interface, enter Menu Mode by pressing the MENU Key.

Depending upon enabled security settings or changes to the setup, the following Entrance and Exit Prompts may be displayed when accessing or leaving Menu Mode:

> ☑ **Note:** *While in Menu Mode, the printer stops processing new data.*

Displayed Menu Item	Explanation
MENU MODE	Accesses the printer's Menu System.
ENTER PASSWORD 0 0 0 0	You are attempting to enter Menu Mode. Security has been enabled and now the correct user-definable password is required before access can be gained to the Menu. Using the ↑ and ↓ Keys, enter the correct numeric password. (The ENTER Key sets the (flashing) number then advances the cursor one space to the right.) After the correct number has been input, press the ESC Key to enter Menu Mode.
SAVE CHANGES?	You are now exiting Menu Mode, but have made changes to the printer's settings. Pressing YES will reconfigure your printer according to these changes; otherwise, pressing NO will cause the printer to revert to previously saved settings. ☑ **Note:** *If changes have been made that require a reset, the printer will automatically invoke that reset.*

4.2.2 Media Settings

Displayed Menu Item	Details
MEDIA TYPE	Selects the printing method.
DIRECT THERMAL	Sets the printer to use heat sensitive media.
✧THERMAL TRANSFER	Sets the printer to use media requiring a ribbon to create an image.
SENSOR TYPE	Selects the top-of-form (TOF) sensing method for the media.
✧GAP	TOF will be recognized by the gaps (die-cut) or notches in the media.
CONTINUOUS	No TOF sensing will be used. The Label Length setting will determine the TOF. (See the LABEL LENGTH setting, below.)
REFLECTIVE	TOF will be recognized by the reflective (black) marks on the underside of the media.
LABEL LENGTH ✧04.00in (0-99.99)	This value will determine the length of the label when the Sensor Type is set to CONTINUOUS .
MAXIMUM LABEL LENGTH ✧16.00in (0-99.99)	Sets the maximum length allowable between TOF marks (when the Sensor Type is set to GAP or REFLECTIVE). If this limit is exceeded, a TOF Fault is declared.
PAPER OUT DISTANCE ✧00.25in (0-99.99)	Sets the length of media travel before an Out Of Stock Fault is declared.
LABEL WIDTH	Sets the maximum distance for the printable width. Objects extending beyond this limit will NOT print; see Appendix C for the default values.
RIBBON LOW DIAMETER ✧1.40 in (1.00-2.00)	Sets the threshold for a low ribbon indication.
SENSOR CALIBRATION ♦	Adjusts the printer to sense the media inserted in the Media Sensor.
PERFORM CALIBRATION	Steps the user through a procedure to calculate the empty, gap (or mark), and paper values for the media sensor.
ADVANCED ENTRY	Allows direct inputs of the empty, gap (or mark), and paper values for the media sensor.
SENSOR LEVELS	Sets threshold values for the media sensor parameters via manual entry.
SENSOR GAIN	Adjusts the sensitivity of the sensor for custom label stock via manual entry.

Media Settings (continued)

Displayed Menu Item	Details
PRINTHEAD CLEANING	Controls the printhead cleaning routine.
CLEAN HEAD SCHEDULE ✧000 in. (* 1000)	Specifies the inch (or centimeter) count to reach before prompting a printhead cleaning. If the number specified is exceeded three times, the printer will fault until cleaning is initiated. ☑ ***Note:*** *The number specified is multiplied by one thousand. Zero (the default value) disables this function.*
CLEAN HEAD COUNTER 0 in.	Indicates the number of inches (or centimeters) since printhead cleaning was last initiated.
RESET COUNTER	Resets the Clean Head Counter to zero.
CLEAN HEAD NOW	Initiates printhead cleaning and resets the Clean Head Counter. See Section 5.4.1 for detailed instructions.

4.2.3 Print Control

☞ *Refer to Section 2.2 for print quality information.*

Displayed Menu Item	Details
HEAT ✧10 (0-30)	Controls the 'burn-time' of the printhead. This is the equivalent of Heat Setting on most label software programs.
PRINT SPEED	Controls the rate of label movement during the printing process; see Appendix C for range.
FEED SPEED	Controls the rate of label movement when the FEED Key is pressed and between printing areas; see Appendix C for range.
REVERSE SPEED	Controls the rate of label movement during backup positioning for start of print, cutting or present distance; see Appendix C for range.
SLEW SPEED	Controls the rate of label movement between printing areas using the GPIO function; see Appendix C for range.
ROW OFFSET ✧00.00in (0-99.99)	Shifts the vertical start of print position. This is the user setting for row adjustment.
COLUMN OFFSET ✧00.00in (0-99.99)	Shifts the horizontal, left-justified start of print position to the right without shifting the Label Width termination point to the right. This is the user setting for Column Adjust.
PRESENT DISTANCE ✧0.00in (0-4.00)	Sets the label stop position past the start of print position. When the next label format is received, the printer will automatically backfeed to the start position. If the present distance is set to zero, the printer will operate without reversing. ☑ ***Note:*** *The default distance for the A-4212 is .65 inches.*

Print Control (continued)

Displayed Menu Item	Details
CUSTOM ADJUSTMENTS ♦	These factory adjustments independently change the listed parameters to finely tune the printer and compensate for slight mechanical differences sometimes evident if multiple printers share label formats.
DARKNESS ✧32 (1-64)	Controls the strobe time to establish the nominal HEAT setting for printhead-specific thermal characteristics.
CONTRAST ✧32 (1-64)	Allows fine-tuning of the relative print edge (gray) adjustment for print quality.
ROW ADJUST ✧000 DOTS	Shifts the vertical start of print position in dots upward or downward to fine-tune the ROW OFFSET setting; see Appendix C.
COLUMN ADJUST ✧000 DOTS (0-128)	Shifts both the horizontal start of print position and the LABEL WIDTH termination point to the right in dots to fine-tune the COLUMN OFFSET setting; see Appendix C.
PRESENT ADJUST ✧064 DOTS (0-128)	Adjusts the label stopping position in dots to fine-tune the PRESENT DISTANCE setting; see Appendix C.

4.2.4 Printer Options

Displayed Menu Item	Details
MODULES	Memory available for user storage of graphics, fonts and label formats. (The physical presence of the respective memory module must be detected to show the function selections in the menu system. See Appendix C for a listing of all possible modules.)
PRINT DIRECTORY	Prints a label directory of selected, or of all available modules, the available space on these modules, the files present, and the type of module and files.
PRINT FILE	Selects from a list of available stored files for printing.
FORMAT MODULE	Selects from a list of available modules for formatting. Note that all existing module data will be erased.
DELETE FILE	Selects from a list of available files for deleting. (Protected modules will not appear, and bytes will not be retrieved until the module containing the deleted file is packed.)
PACK MODULE	Removes files marked as deleted, and defragments existing file structures to recover space.

Printer Options (continued)

Displayed Menu Item	Details
CUTTER	Option used to cut media into separate labels.
✧AUTO	Automatically senses the presence of the cutter. If present, the cutter is enabled. If not detected, the cutter is ignored.
ENABLED	Enables the cutter. The presence of the cutter must be detected or read errors are generated.
DISABLED	Disables the cutter.
RIBBON SAVER	Option used to conserve ribbon when the label contains areas of no print (white space).
✧AUTO	Automatically senses the presence of the ribbon saver option. If present, the option is enabled. If not detected, the option is ignored.
ENABLED	The presence of the ribbon saver option must be detected or read errors are generated.
DISABLED	Disables ribbon saving.
SCANNER	Option used to check linear bar codes in the picket-fence orientation (bar codes perpendicular to the label's leading edge).
MODE	Enables bar codes to be read by the Scanner.
✧AUTO	Automatically senses the presence of the scanner. If present, the scanner is enabled to read bar codes. If not detected, the scanner is ignored.
ENABLED	The presence of the scanner must be detected or read errors are generated.
DISABLED	Disables the scanner.

Printer Options (continued)

Displayed Menu Item	Details
BARCODES	Enables the scanner to read the respective bar code. Also see Appendix B. ☑ ***Note:*** *To speed throughput and decoding integrity only enable the symbologies that you will be reading.*
✧CODE 39	Enables or disables Code 39.
IATA	Enables or disables IATA.
✧CODABAR	Enables or disables Codabar.
✧INTERLEAVED 2 OF 5	Enables or disables Interleaved 2 OF 5.
✧INDUSTRIAL 2 OF 5	Enables or disables Industrial 2 OF 5.
✧CODE 93	Enables or disables Code 93.
✧CODE 128	Enables or disables Code 128.
✧MSI/PLESSEY	Enables or disables MSI/Plessey.
✧EAN(13/8)	Enables or disables EAN(13/8).
✧EAN(13/8)+2	Enables or disables EAN(13/8) + 2 digit addendum.
✧EAN(13/8)+5	Enables or disables EAN(13/8) + 5 digit addendum.
✧UPC(A/E)	Enables or disables UPC(A/E).
✧UPC(A/E)+2	Enables or disables UPC(A/E) + 2 digit addendum.
✧UPC(A/E)+5	Enables or disables UPC(A/E) + 5 digit addendum.
BARCODE COUNT ✧00 (0-99)	Sets the specific number of bar codes to be read on the label. 00 selects AUTO Mode, allowing a variable number of bar codes to be read per label format. ☑ ***Note:*** *AUTO Mode should not be used with imaged (bitmapped) bar codes or with certain bar code addendums; see Appendix B for a listing.*

Printer Options (continued)

Displayed Menu Item	Details
MIN READABLE HEIGHT	Ensures bar code integrity by selecting the vertical distance of the bar code that must have identical reads. The printer will calculate the scan rate and the number of required consecutive reads based on the selected height and print speed. ☑ **Note:** *The selected distance should not exceed 50% of the measured bar code height.*
1/16 in (1.5 mm)	Ensures that 1/16 inch of the bar code is 100% readable.
2/16 in (3.0 mm)	Ensures that 1/8 inch of the bar code is 100% readable.
3/16 in (4.5 mm)	Ensures that 3/16 inch of the bar code is 100% readable.
1/4 in (6 mm)	Ensures that 1/4 inch of the bar code is 100% readable.
1/2 in (12.5 mm)	Ensures that 1/2 inch of the bar code is 100% readable.
✧DISABLED	When 'Disabled' is selected, the printer defaults to REDUNDANCY LEVEL.
REDUNDANCY LEVEL	Ensures the data integrity of the bar code. The selected level determines the number of consecutive, identical decodes that are required to pass the bar code (i.e., if set to three times, the bar code will not pass until it has been decoded with the same value three successive times.) ☑ **Note:** *Depending upon the print speed, higher verification levels may cause erroneous failures when scanning multiple bar codes or bar codes that are small in height. Refer to the documentation supplied with the Scanner for the exact number of scans at a given print speed.*
READ BARCODE (1X)	One decode is required per bar code.
✧READ BARCODE (2X)	Two consecutive, identical decodes are required per bar code.
READ BARCODE (3X)	Three consecutive, identical decodes are required per bar code.
READ BARCODE (4X)	Four consecutive, identical decodes are required per bar code.
READ BARCODE (5X)	Five consecutive, identical decodes are required per bar code.
READ BARCODE (6X)	Six consecutive, identical decodes are required per bar code.
SET DEFAULTS	Resets the current settings of the Scanner to the default settings.

Printer Options (continued)

Displayed Menu Item	Details
GPIO PORT	Used to interface the printer to external controlling devices (see Appendix D).
GPIO DEVICE	Sets the GPIO Port to work with a specific type of device.
APPLICATOR	Enables the GPIO for a label applicator.
BARCODE VERIFIER	Enables the GPIO for a bar code verifier.
✧DISABLED	Disables the GPIO Port.
START OF PRINT	Programmable signal input that controls the Start of Print (SOP) process.
✧ACTIVE LOW	SOP signal must go 'low' for at least 50 milliseconds to initiate printing.
ACTIVE HIGH	SOP signal must go 'high' for at least 50 milliseconds to initiate printing.
END OF PRINT	Programmable signal output that signifies the End of Print (EOP) process.
✧ACTIVE LOW	Outputs a logic 'low' following printing.
ACTIVE HIGH	Outputs a logic 'high' following printing.
LOW PULSE	Outputs a low pulse (approximately 30 milliseconds long) following printing.
HIGH PULSE	Outputs a high pulse (approximately 30 milliseconds long) following printing.
RIBBON LOW	Programmable signal output that signifies the RIBBON LOW DIAMETER condition; see Section 4.2.2.
✧ACTIVE HIGH	Outputs a logic 'high' when the ribbon reaches the Ribbon Low Diameter setting.
ACTIVE LOW	Outputs a logic 'low' when the ribbon reaches the Ribbon Low Diameter setting.

4.2.5 System Settings

Displayed Menu Item	Details
CONFIGURATION FILE ♦	Options for storage and recall of printer configuration files. See Appendix F for details.
RESTORE AS CURRENT	Provides a list of available configuration files. Selecting a file from the list causes a printer reset; afterward, the printer is configured according to the activated file.
SAVE SETTING AS	Saves the entire effective configuration of the printer to a file. Unique names with up to nineteen characters are possible.
DELETE FILE	Provides a list of available configuration files. Files selected are immediately removed, freeing the module. ☑ ***Note**: A currently activated file cannot be deleted.*
FACTORY SETTING FILE	Provides a list of available configuration files. The selected file will be restored whenever a Level 1 reset is performed; see Section 6.4.1.
INTERNAL MODULE ✧1024 KB (100-5120)	Sets the number of 1K blocks allocated for the internal RAM 'D' module.
DEFAULT MODULE ✧D	Sets the default module used to store files when no other module is specified; see Appendix C.
SCALEABLE FONT CACHE ✧0312 KB (100-5120)	Sets the number of 1K blocks allocated for the scaleable font engine. Available memory dependent upon model; see Appendix C.
SINGLE BYTE SYMBOLS	Selects the code page used to print single byte fonts unless otherwise specified in DPL.
✧PC_850 MULTILINGUAL	One of 66 selectable standard sets; see the *Class Series Programmer's Manual* for details.
DOUBLE BYTE SYMBOLS	When equipped with the ILPC option, this selects the code page used to print double byte fonts unless otherwise specified in DPL; see the *Class Series Programmer's Manual* for details.
✧UNICODE	Unicode (including Korean)
GB	Government Bureau Industry Standard; Chinese (PRC)
BIG 5	Taiwan encoded
JIS	Japanese Industry Standard
SHIFT JIS	Shift Japanese Industry Standard
EUC	Extended UNIX Code
TIME AND DATE	Allows the user to set the printer's time and date.

System Settings (continued)

Displayed Menu Item	Details
MEDIA COUNTERS ♦	Internal record of inches printed and time of use.
ABSOLUTE COUNTER	Shows the number of inches printed since being set at the factory. Not resettable.
RESETTABLE COUNTER	The number of inches printed since the last reset. User may reset.
RESET COUNTER	Resets the Resettable Counter to zero.
PRINT CONFIGURATION	Prints the effective configuration of the system. In addition, if settings were changed that require a reset to become effective, this will be indicated with the '§' symbol. A bulleted item (•) indicates that it was changed via the host, but not yet saved in Flash memory.
CONFIGURATION LEVEL ♦	To upgrade the application program (resident software) version of the printer, the hardware and software compatibility levels must match for the update to be accepted. This information is displayed here and on the configuration label.
PRINTER KEY	Identifies the unique key number of the printer, in the form: `vvvv-cwxx-yyyyyy-zzz` Where: `vvvv` Represents the model number of the application loaded `cwxx` Represents the hardware/software feature level, where: `c` – represents the printer class. `w` – represents hardware feature level of the main board. `xx` – represents the software feature level: 10 = Standard DPL 20 = Internal CG Times Font (Software features are accepted up to the 'xx' value - increases beyond that will require an authorization code). `yyyyyy` Is a manufacturing date code `zzz` Is a unique time stamp
APPLICATION VERSION	Displays the Application version of the printer's firmware.
BOOT LOADER	Displays the Boot Loader version of the printer's firmware.
UPGRADE PRINTER CODE	Used to upgrade the software feature level of the printer. Datamax authorization is required.
UNLOCK FEATURE	Used to unlock the additional optional features within the printer. Datamax authorization is required.

System Settings (continued)

Displayed Menu Item	Details
SET FACTORY DEFAULTS	Parameters in this menu listing with the '✧' symbol are the designated defaults.
SET FACTORY DEFAULTS	Restores the current settings to the factory defaults or, if selected, the Factory Setting File. ☑ ***Note:*** *The reset will be automatic. If no Factory Setting File is used, all menu settings (except* `HEAD BIAS, CUSTOM ADJUSTMENTS` *and calibrations) will be restored.*
FORMAT ATTRIBUTES	Affects the manner in which overlapping text and graphics are treated. See the *Class Series Programmer's Manual* for details.
✧XOR	Intersecting text, images, and bar codes will not be printed (but an odd number of overlapping objects will print.)
OPAQUE	Intersecting text, images, and bar codes are obliterated by those formatted last (each character is treated as opaque).
TRANSPARENT	Intersecting text, images, and bar codes print on top of one another.
BUZZER	Audible signaling device that sounds to acknowledge User Interface entries and, if enabled, printer warning and fault conditions.
✧ENABLED	Turns 'On' the buzzer for warning and fault conditions.
DISABLED	Turns 'Off' the buzzer for warning and fault conditions.
HEAD BIAS	Switches the dot zero orientation. (The dot zero left / right reference point is given relative to the label output side of the printer). ⚠ ***WARNING:*** *Switching this setting will cause the printer to reverse all of the media movement directions.*
✧STANDARD	X origin is the leftmost location of the printhead; printing is left justified.
RIGHT HAND	X origin is the leftmost location of the label width; printing is right justified.
LABEL ROTATION ♦	Rotates the label format 180 degrees before printing.
ENABLED	Flips label formats from top to bottom.
✧DISABLED	Formats are printed normally.

System Settings (continued)

Displayed Menu Item	Details
IMAGING MODE	Determines the pre-imaging process of the label format. ☑ ***Note:*** *This selection can affect the accuracy of time-stamped labels and label throughput.*
✧MULTIPLE LABEL	Images multiple labels as memory permits, achieving the fastest throughput; however, if time-stamping, the time will reflect the moment the label is imaged rather than when actually printed.
SINGLE LABEL	Images the next label only after the previous label has been successfully printed. Single processing provides time-stamps that are more accurate, but it slows label throughput time.
PAUSE MODE	Allows the printer to suspend printing between each label until the PAUSE Key is pressed.
ENABLED	Requires an operator to press the PAUSE Key after each label.
✧DISABLED	Completes label batches without pausing between labels.
PEEL MODE	Specifies that the printer is to wait for the GPIO Start of Print signal.
ENABLED	Inhibits the feed function until the Start of Print signal is received.
✧DISABLED	The feed function is always enabled.
SECURITY ♦	Provides the user with the ability to password-protect all settings available through the User Interface.
SELECT SECURITY	Enables or disables the security feature of the User Interface.
MENU AND TEST	The Menu and Test areas will require a password before access is granted (these buttons will be shaded, indicating that security is enabled).
SECURE MENU	The Menu area will require a password before access is granted (the button will be shaded, indicating that security is enabled).
✧DISABLED	All menu items are accessible without protection.
MODIFY PASSWORD	Modifies the numeric password required to access the menu system when security is enabled. You will be prompted to enter a new password. Enter a password using the ↑ and ↓ Keys. (The ENTER Key sets the current [flashing] number then shifts the cursor to the right.) After the password has been input, press the ESC Key. When prompted to '`CONFIRM NEW PASSWORD`,' enter the same numeric password to proceed with the change.

System Settings (continued)

Displayed Menu Item	Details
UNITS OF MEASURE	Selects the measurement system in which the system's settings are represented in the menu system and on configuration labels.
✧IMPERIAL	Lengths and counters given in inches.
METRIC	Lengths are given in millimeters and counters in centimeters.
INPUT MODE	Defines the type of printer processing.
✧DPL	Standard DPL processing.
LINE	Standard DPL processing with additional Line Mode template processing enabled. Line Mode exacts data terminated by a carriage return to be inserted in a DPL template and printed.
SOP EMULATION	Enables the <STX>O and <STX>f print positioning commands to allow backward compatibility with label formats designed for other printers. (When changing these values, the printer will automatically feed two labels to setup the new print position.)
✧DISABLED	No emulation: natural start of print position. (System Commands <STX>O and <STX>f are ignored).
110 (PRODPLUS)	Emulates the Prodigy Plus® printer.
220 (ALLEGRO)	Emulates the Allegro® printer.
250 (PRODIGY)	Emulates the Prodigy™ printer.
BACK AFTER PRINT	When a Present Distance is set with GPIO enabled, this determines the timing of the label back up.
ENABLED	Immediately backs-up the label after the applicator issued Start of Print signal is received for faster throughput.
✧DISABLED	Initiates repositioning only when the next label is ready to print. May help prevent the curling of the label edge.
BACKUP DELAY (1/50 S) ✧000 (0 – 255)	Instructs the printer to automatically retract a presented label after the specified time delay elapses. Units are selectable in fiftieths of a second. Zero indicates retraction only when the next label is received and processed to print.
FONT EMULATION	This setting allows font substitution for all Datamax internal fonts. See Appendix B for examples.
✧STANDARD FONTS	Prints using standard available fonts. See Appendix B for examples.
CG TIMES	Prints using CG Times fonts only.
USER ID S50	Prints using a downloaded font only.

System Settings (continued)

Displayed Menu Item	Details
LABEL STORE	When recalling stored label formats, this setting determines the command recall level used.
✧STATE & FIELDS	Recalls the printer state (that is, the heat setting, speed settings, etc) and the label-formatting commands of the stored label.
FIELDS ONLY	Recalls only the label-formatting commands of the stored label.
MENU LANGUAGE ♦	Selects the language in which the menu system messages and configuration label are shown. Only languages that are resident will be shown. See Appendix E for downloading information.
✧ENGLISH	English
FAULT HANDLING	When a fault condition (ribbon out, media out, etc.) is detected, this setting determines the level of intervention and the disposition of the label being printed at the time the fault occurred.
LEVEL	Selects the printer's action, the action required by the operator, and the label's reprint status.
✧STANDARD	Printing stops and a fault message is displayed. After the problem is corrected, the FEED Key must be pressed to clear the fault. The label in process is reprinted.
VOID AND RETRY	Depending upon the RETRY COUNT, one of the following actions when faulted: • If the Retry Count setting has not been exceeded, 'VOID' is printed on the label in process and reprinting occurs automatically; or, • If the Retry Count has been exceeded, printing stops and a fault message is displayed. After the problem is corrected, the FEED Key must be pressed to clear the fault. The label in process is reprinted; or, • If the CANCEL Key is pressed the operator now has a reprint option: To allow a reprint, press the ESCAPE Key; or, to cancel the reprint, press the ENTER Key (and, to cancel the entire batch by press the ENTER Key again.) ☑ ***Notes:*** *1) If a Linear Scanner is not attached, this menu item will cause the printer to perform as it does in the Standard fault handling setting (see above), except that VOID will be printed on the faulted label. 2) VOID will not be printed when insufficient space exists for the height of the text (see VOID DISTANCE, below) or if the fault occurred after the entire label was completed (i.e., when the label reaches its Present Distance at or above the TOF). 3) The Void Message can be customized, see the Class Series Programmer's Manual for downloading details.*
NO REPRINT	Printing stops and a fault message is displayed. After the problem is corrected, the FEED Key must be pressed to clear the fault. The label in process is *not* reprinted.

System Settings (continued)

Displayed Menu Item	Details
VOID DISTANCE ✧0.50 in (.10-2.00)	Sets the distance to backup the faulted label to print 'VOID' on its trailing edge, which also indirectly establishes the font size of the void message.
RETRY COUNT ✧1 (0-3)	Establishes the number of times the printer will attempt to reprint a label. If the last label printed in this count has been voided, the printer will stop and display a fault message. ☑ ***Note:*** *Retry counts above 1 are only valid for printers equipped with the Linear Scanner option.*

4.2.6 Communications

Displayed Menu Item	Details
SERIAL PORT A	Controls the communications settings for Serial Port A.
BAUD RATE	Determines the serial communication rate.
38400	38400 bits per second
28800	28800 bits per second
19200	19200 bits per second
✧9600	9600 bits per second
4800	4800 bits per second
2400	2400 bits per second
1200	1200 bits per second
PROTOCOL	Sets the data flow control (handshaking) method.
✧BOTH	Uses both handshaking methods.
SOFTWARE	XON/XOFF.
HARDWARE	CTS/DTR.
NONE	No flow control is used.
PARITY	Sets Word parity.
✧NONE	No parity.
ODD	Odd parity.
EVEN	Even parity.
DATA BITS	Sets Word length.
7	Seven-bit Word length.
✧8	Eight-bit Word length.
STOP BITS	Sets the number of stop bits.
✧1	One stop bit
2	Two stop bits
SERIAL PORT B	This port controls the communications settings for the Aux Serial Port on the Applicator Interface Card. The available settings are the same as those for the Serial Port A, above.
PARALLEL PORT A	Controls the communications settings for Parallel Port A.
PORT DIRECTION	Determines if data is sent from the printer to the host via the parallel port.
✧UNI-DIRECTIONAL	One-way printer communication.
BI-DIRECTIONAL	Enables IEEE 1284 back-channel operation.

Communications (continued)

Displayed Menu Item	Details
PARALLEL PORT B	Same as Parallel Port A, for an optional Ethernet connection. If not present, this displays 'NOT INSTALLED' when accessed.

☑ ***Note:*** *If 'LOCKED' appears when attempting to access the NIC ADAPTER submenu, the printer may have active print requests or multiple users may be trying to access these parameters (for example, during simultaneous telenet sessions).*

NIC ADAPTER♦	DMXNet and DMXrfNet are the optional Network Interface Card (NIC) Adapters. If not present, this displays 'NOT INSTALLED' when accessed. After making changes to these parameters, save the changes, exit the menu system, and cycle the printer's power 'Off' and 'On' for the changes to take effect. ☑ ***Note:*** *The boot process (taking up to two minutes) must be completed at power-up. During this time, the NIC Adapter will not be accessible or configurable; "DMXNET INACTIVE" will be indicated when in the menu system or on a Configuration Label. After this process, you will be able to configure the options provided using the menu system.*
IP ADDRESS	The static IP address of the NIC Adapter in standard dotted-decimal format.
SUBNET MASK	The static subnet assigned to the NIC Adapter.
GATEWAY	Specifies the network gateway address the NIC Adapter should use.
SNMPTRAP DESTINATION	Selects the Network IP address where all SNMP Traps will be sent. If zeroed, no traps are sent.
PROTOCOL	Sets the network protocol to be recognized by the NIC Adapter.
NETWARE	Allows the printer to be driven from an NDS Novell Print Queue.
✧ENABLED	NetWare is enabled by default.
DISABLED	Ignores the NetWare protocol. Select this option if NetWare is not needed.
DISCOVERY	This is the address discovery method used by the card if a static address is not utilized. If no server for any of the discovery methods is found, the static value specified above is used. ☑ ***Note:*** *For faster NIC Adapter boot times, disable any discovery methods not used.*

Communications (continued)

Displayed Menu Item	Details
DHCP	Dynamic Host Control Protocol. Automatically assigns an IP address from a DHCP Server.
✧ENABLED	DHCP is enabled by default. This means that the card will send a broadcast into the network on start-up in order to receive an IP Address from the responsible server. ⚠ ***WARNING:*** *An IP Address assigned by DHCP has precedence over any stored static IP Address.*
DISABLED	Disables DHCP. ☑ ***Note:*** *Select this option to ensure that any stored static IP is used by the NIC Adapter.*
SET FACTORY DEFAULTS	Restore the current NIC Adapter settings to the factory defaults.
HOST SETTINGS ♦	Settings that affect all communications with a host.
HOST TIMEOUT ✧10 SEC (1-60)	The number of seconds a communications port must be idle before the printer may process data from a different port. This value is also used to "timeout" an image / label format download (i.e., if, at any time, data flow stops before a complete label format is received, the data will be ignored).
CONTROL CODES	Allows the operator to change the prefix of the software commands interpreted by the printer.
✧STANDARD CODES	Hex 01 = SOH command; Hex 02 = STX command; count-by = ^; Hex 1B = ESC; Hex 0x0D = Carriage Return
ALTERNATE CODES	Hex 5E = SOH command; Hex 7E = STX command; count-by = @; Hex 1B = ESC; Hex 0x0D = Carriage Return
ALTERNATE CODES 2	Hex 5E = SOH command; Hex 7E = STX command; count-by = @; Hex 1B = ESC; Hex 0x7C = Carriage Return
CUSTOM CODES	Each DPL command (SOH, STX, CR, and count-by) may be selected by entering the desired Hex code. (The ↑ and ↓ Keys will scroll the characters, while the ENTER Key selects character and then advances the cursor.)
FEEDBACK CHARACTERS	Returns a Hex 1E, [RS], after each label successfully prints, and a Hex 1F, [US], after each batch of labels is printed.
ENABLED	Feedback characters are sent to the host.
✧DISABLED	No feedback characters are sent.
ESC SEQUENCES	Allows data containing invalid ESC control code sequences to be processed; helpful since some systems send a "banner" to the printer.
✧ENABLED	Normal printer operating mode.
DISABLED	ESC sequences are ignored and the data is processed. Bitmapped font downloads are disabled in this mode.

Communications (continued)

Displayed Menu Item	Details
HEAT COMMAND	Allows the user to disable the DPL Heat Command, providing compatibility with other DATAMAX printers.
✧ENABLED	Normal printer operating mode.
DISABLED	DPL Heat command is ignored. The heat value is controlled via the menu setting; see Section 4.2.3.
SPEED COMMANDS	Allows the user to disable the DPL speed commands (Print, Feed, Slew, and Reverse).
✧ENABLED	Normal printer operating mode.
DISABLED	DPL speed commands are ignored. The speeds are controlled via the menu setting; see Section 4.2.3.
TOF SENSING COMMANDS	Allows the user to disable the DPL Top of Form commands (Gap, Continuous, and Reflective).
✧ENABLED	Normal printer operating mode.
DISABLED	DPL TOF commands are ignored. The TOF is controlled via the menu setting; see Section 4.2.2.
SYMBOL SET COMMAND	Allows the user to disable the DPL Single and Double Symbol Set selection commands.
✧ENABLED	Normal printer operating mode.
DISABLED	DPL Symbol Set commands are ignored. The Symbol Set selection is controlled via the menu setting; see Section 4.2.5.
CNTRL-CODES (DATA)	Allows the user to remove control codes (data < 20 Hex) from the data fields. The selected line terminator is processed.
✧ENABLED	Normal printer operating mode.
DISABLED	DPL Control Code (SOH, STX, CR, ESC, and ^) functions are ignored.
STX-V SW SETTINGS	Allows the user to disable the DPL software switch setting commands.
✧ENABLED	Normal printer operating mode.
DISABLED	DPL option-enable command (<STX>V) is ignored.
MAX LENGTH COMMAND	Allows the user to disable the DPL maximum label length command.
✧ENABLED	Normal printer operating mode.
DISABLED	The DPL <STX>M command is ignored. Maximum label length is controlled via the menu setting; see Section 4.2.2.

4.2.7 Diagnostics

Displayed Menu Item	Details
HEX DUMP MODE ♦	Most commonly used for troubleshooting. Prints data and instructions received from the host rather than interpreting them as label formats; see Section 6.3.
ENABLE	Prints raw ASCII data received from the host rather than executing the commands.
✧DISABLE	Executes and prints label formats (normal operating mode).
OPTIONS TESTING ♦	Allows or performs diagnostics of specific options within the printer.
TEST CUTTER	Performs a functional test of the cutter.
PERFORM TEST 1 TIME	The test will cycle the selected number of times (1, 10, or 100; use the ↑ and ↓ Keys) with the results displayed following each attempt.
TEST RIBBON SAVER	Performs a functional test of the ribbon saver circuits and mechanisms.
PERFORM TEST 1 TIME	The test will cycle the selected number of times (1, 10, or 100; use the ↑ and ↓ Keys) with the results displayed following each attempt.
TEST GPIO	Performs a functional test of the General Purpose Input Output interface. See Appendix D.
MONITOR GPIO INPUT SOP FEED PAUSE REPRT 1 1 1 1	Input values are displayed for the SOP (Start of Print), Feed, Pause, and Reprint lines. ☑ ***Note:*** *Unconnected lines may display a zero or one value.*
TEST GPIO OUTPUT EOP RL SR MO RO DRDY 0 0 1 1 1 1	Output logic values are reported, where: EOP = End of Print; RL = Ribbon Low; SR = Service Required; MO = Media Out; RO = Ribbon Out; and, DRDY = Data Ready. (The ↑ and ↓ Keys toggle the output state, while the → Key advances the cursor.) See Appendix D for the GPIO Port pin-outs.
LOOPBACK	Performs an internal test of the GPIO Port circuitry. ☑ ***Note:*** *Before executing this test, remove any connection to the GPIO Port.*
PRINT SIGNAL INFO	Prints a label containing GPIO Port signal names, programmed settings, and current states. See Appendix D for a sample of the label.

Diagnostics (continued)

Displayed Menu Item	Details
TEST SCANNER	Performs a functional test of the optional linear scanner.
SCAN TEST	Enters a "read once mode." A bar code is read and the decoded results are displayed.
ALIGNMENT TEST	Enters a "constant read mode." Bar codes are read; decoded results are displayed; and, the read-count is incremented.
PRINT TEST RATE (min) ♦ ✧000 (0-120)	The number of minutes to delay between the printings of batches of Test Labels.
SENSOR READINGS ♦	Analog Sensor readings are displayed.
THR TRAN RIB M 24V HD RANK 255 255 255 255 255 255	Live sensor values are displayed. Maximum values are shown in this example, where: THR = thermistor sensor; TRAN = transmissive (gap) media sensor (REFL is shown when SENSOR TYPE is set to 'reflective'); RIB M = ribbon motion sensor; 24V = 24 volt DC power supply sensor; HD = head-down sensor; and, RANK = the value of the printhead ranking resistor.
RIBBON SENSOR LIMITS ♦	Displays ribbon sensor ADC low and high values used for motion detection.
RIBBON ADC LOW HIGH 070 164	Approximate default values are shown here (actual values will vary).

4.2.8 MCL Options

Displayed Menu Item	Details
MCL AT POWER-UP ♦	MCL (Macro Command Language) is a tool suite designed for data collection applications. The printer will accept input data from peripheral devices and the application can request and send data to locally resident lookup files or remote databases.
ENABLED	After power to the printer is turned 'Off' and 'On,' MCL Mode will be started. The printer is now ready to accept input data from peripheral devices such as barcode scanners, weigh scales, and keyboards without the need of a host computer; see Section 4.1.4.
✧DISABLED	Normal printer functions.
START MCL ♦	MCL Mode will be started after exiting the menu; see Section 4.1.4.

4.3 Printer Messages

The printer displays several different types of information (if not in Menu or Test Mode):

- Enter and Exit Prompts; see Section 4.2.1
- Alert Prompts and Condition Messages; see Section 4.3.1.
- Application and Boot Loader Updating Messages; see Sections 5.5 and 5.6.
- Fault and Warning Messages; see Section 6.2.

4.3.1 Alert Prompts and Condition Messages

Alert Prompts appear when an action is required of the operator, while Condition Messages are used to indicate an operational state of the printer.

Prompts and Condition Messages		
Displayed Message	**Description**	**Cause(s)**
CLEARING FAULTS	The printer is trying to clear a fault condition.	The FEED Key was pressed after a fault.
CALIBRATING	Media calibration is being performed.	The FEED Key was pressed and held.
CANCEL REPRINT ENTER KEY = YES	The current label will not be reprinted if the ENTER Key is pressed. (Any labels remaining in the batch will be printed.)	The CANCEL or TEST Key was pressed during the fault handling process.
CANCEL BATCH ENTER KEY = YES	The remaining labels in the current batch will not be printed if the ENTER Key is pressed.	The CANCEL or TEST Key was pressed during a batch job.
DMXNET INITIALIZING	Normal power-up and soft reset condition when equipped with the DMXNet or DMXrfNet option.	The network card is initializing. Depending upon the programmed settings, this process can take up to two minutes.
OFFLINE	The printer is in Menu or Test Mode.	The Menu or Test Key has been pressed.
PAUSED	The printer is paused.	The PAUSE Key has been pressed or Paused Mode has been selected.

Prompts and Condition Messages *(continued)*		
Displayed Message	**Description**	**Cause(s)**
NOT INSTALLED	Indicates the menu item cannot be enabled.	The option is not installed or cannot be detected by the printer.
PRINTHEAD CLEANING	Indicates that printhead cleaning is in progress.	The TEST Key was pressed and held, or 'CLEAN HEAD NOW' was selected.
READY	Normal operating mode. The printer is ready to receive label formats, downloads, etc.	The printer is in Ready Mode.
REMOVE RIBBON PRESS ANY KEY	In order to initiate printhead cleaning, ribbon must be removed.	The TEST Key was pressed and held, or 'CLEAN HEAD NOW' was selected.
SYSTEM INITIALIZING	Normal power-up and soft reset condition.	Follows the 'SYSTEM RESET IN PROGRESS' message after a reset or power-up.
SUCCESSFUL PRESS ANY KEY	Printhead cleaning was successfully completed.	The TEST Key was pressed and held, or 'CLEAN HEAD NOW' was selected.
SYSTEM RESET IN PROGRESS	Normal power-up and soft reset condition.	The user has reset the printer via the host or User Interface.
UNCALIBRATED	The media calibration must be performed; see Section 5.1.	The printer is not calibrated.
WAITING FOR DATA	A Start of Print signal has been received.	The printer is waiting for label data to be supplied by the host.
WAITING FOR SIGNAL	A label is waiting to be printed.	The printer is waiting for the Start of Print signal to be supplied by the applicator.
XXXX OF XXXX PRINTING	The print job is being processed.	The printer is updating the batch status, showing beginning and remaining label counts.

4.4 Test Mode

The internally generated Test Labels are printed at pre-selected speed and heat settings. Changes to these label settings can be made from the Menu System or via software commands.

> ☑ ***Notes:***
>
> *(1) Except as noted, use full width media to capture the entire format; otherwise, adjust the Label Width (Section 4.2.2) and Leveling Cam settings (Section 5.2.1) to the media's width.*
>
> *(2) In Test Mode, press the ESC Key or the TEST Key to stop printing.*
>
> *(3) A printing time delay can be set (see Print Test Rate, Section 4.2.7).*

4.4.1 Print Quality Label

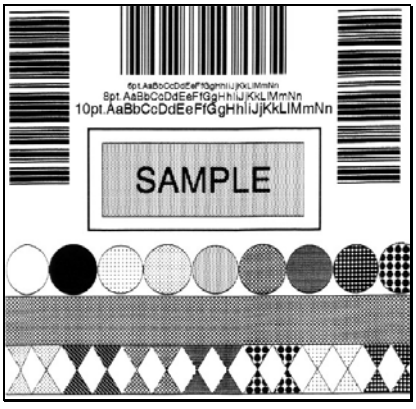
The Print Quality Label is a general indicator of overall print quality. The format, consisting of compliant fence and ladder bar codes, assorted sizes of fonts, and graphic fill patterns, can be used to ensure conformance, as well as aesthetics. Generate a Print Quality Label as follows:

1. Press the TEST Key.

3. Press the ← Key to scroll to 'Print Quality Label.'

4. Press the COUNT Key to select a quantity; see Section 4.1.3.

5. Press the ENTER Key to begin printing.



4.4.2 Configuration Label

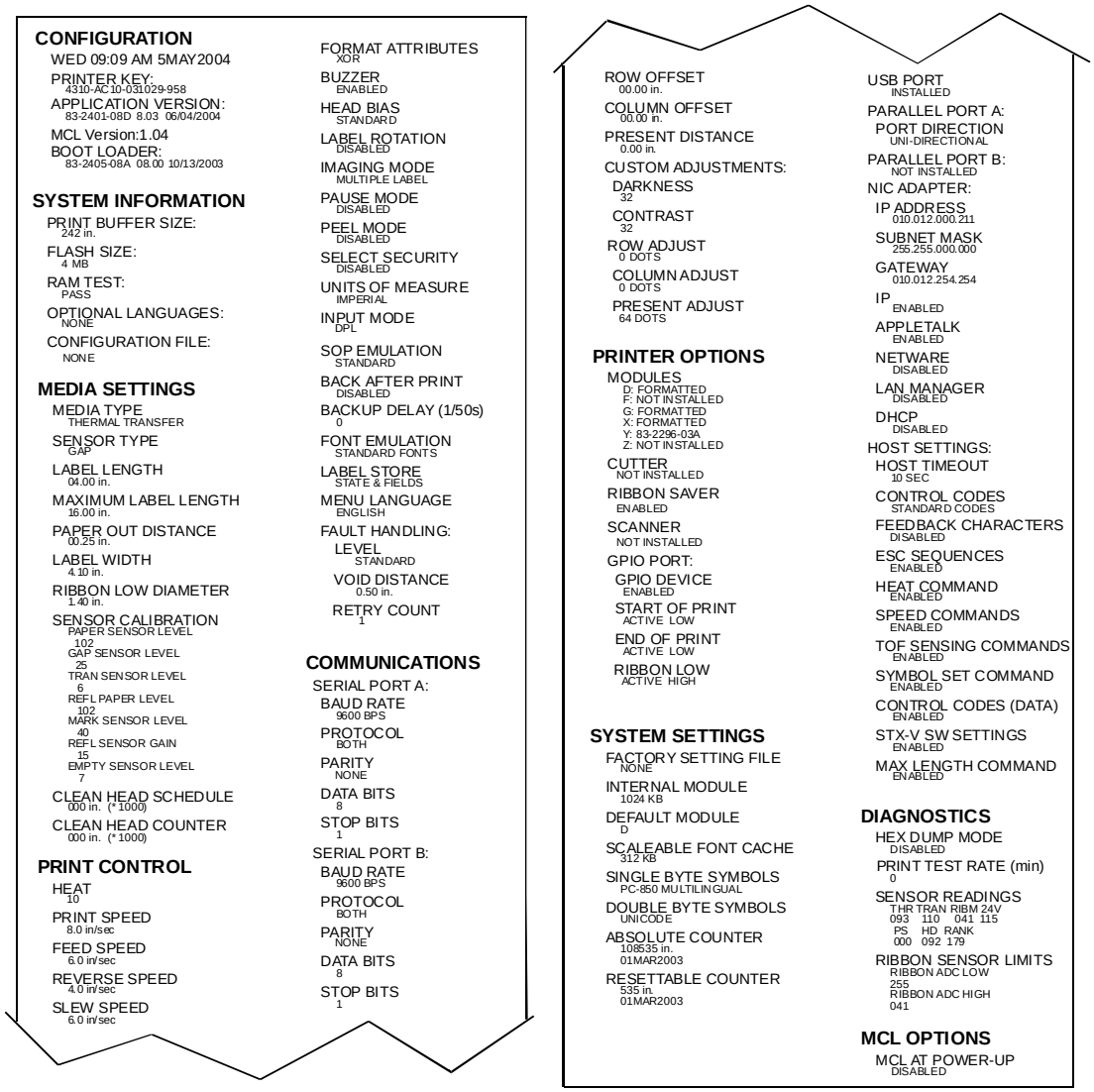
The Configuration Label provides current printer database information, as detailed in Section 4.2. Generate a Configuration Label as follows:

1. Press the TEST Key.

2. Press the ← Key to scroll to 'Print Configuration.'

3. Press the ENTER Key to begin printing.

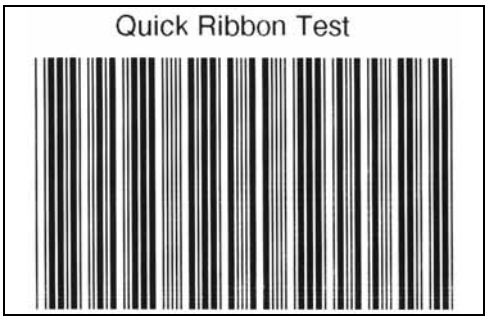
> ☑ **Notes:** *(1) The information on this label may vary with the printer model, firmware version and options. (2) To capture all data, use media that is at least 2 inches (51 mm) wide and adjust the Label Width setting accordingly (see Section 4.2.2).*



4.4.3 Quick Ribbon Test Label

The Quick Ribbon Test Label is an indicator of thermal transfer print quality. Generate a Quick Ribbon Test Label as follows:

1. Press the TEST Key.
2. Press the ← Key to scroll to 'Ribbon Test Label.'
3. Press the COUNT Key to select a quantity; see Section 4.1.3.
4. Press the ENTER Key to begin printing.



4.4.4 Validation Label

The Validation Label is another useful tool for establishing print quality. Generate a Validation Label as follows:

1. Press the TEST Key.
2. Press the ← Key to scroll to 'Validation Label.'
3. Press the COUNT Key to select a quantity; see Section 4.1.3.
4. Press the ENTER Key to begin printing.

4.4.5 Print Last Label

Print Last Label reprints the last label format printed. The format can be any of the Test Labels, a label from the host, or one recalled from memory.

> ☑ ***Note:*** *If a job was cancelled prior to its completion, or if power has been removed since the last print job and the request for this label, this selection will print a 'VOID' message.*

4.4.6 User Defined Label

The User Defined Label reprints from a list of previously printed label formats. Use the ← Key to scroll through the listing, and then use the ENTER Key to select and print the label.

> ☑ **Note:** *If a job was cancelled prior to its completion, or if power has been removed since the last print job and the request for this label, 'NO FILES AVAILABLE' will be displayed and no printing will occur.*

4.4.7 Demo

The Demo mode displays a rotating globe and sample system fonts in the graphic display center window. Use the TEST Key to return to test mode or the MENU Key to return to the system menu.

5 Adjustments and Maintenance

5.1 Media Sensor Calibration

Calibration ensures consistent label detection across the range of media types.

5.1.1 Quick Calibration

Perform the Quick Calibration during initial printer set-up or after changing the media to fine-tune the media sensor's gap and label values.

> *This procedure is not required for continuous media.*
>
> *If 'Uncalibrated' is displayed, follow the Media Sensor Calibration procedure in Section 5.1.2..*

1. Ensure that media is correctly loaded (see Section 3.4), that the Media Sensor is properly adjusted (see Section 3.5), that the Sensor Type has been correctly selected (see Section 4.2.2), and that the printer is in an idle state.

2. Press and hold the FEED Key. *Media will begin to advance.*

3. Allow the printer to output at least two complete labels before releasing the FEED Key.

Upon successful completion, the 'Calibration Completed' message will flash; the printer will feed to the next label TOF and 'Ready' will be displayed. (A 'Warning Low Backing' message may appear if using notched media or media on a transparent liner; however, the calibration was successful).

> ☑ ***Note:*** *Media containing large gaps may require a change in the 'Paper Out Distance' setting before Quick Calibration; see Section 4.2.2.*

Calibration Hints: With certain media, the printer may have trouble differentiating between the label and liner. If 'Cannot Calibrate' is displayed, try calibrating over a longer distance, as follows:

- Press and hold the FEED Key until the printer has output three (or more) labels.

If this method also fails (that is 'Cannot Calibrate' is displayed again), perform the Standard Calibration (Section 5.1).

5.1.2 Standard Calibration

Perform the Standard Calibration when 'Cannot Calibrate' or 'Uncalibrated' is displayed. During the process, the printhead assembly can be raised for visual access. In addition, displayed sensor readings can be used to indicate the best position over the media, which is helpful when using small, position-critical TOF notches or marks. Three readings are required:

- Empty: No media in the sensor.
- TOF Mark: Only the backing, notch, or reflective mark in the sensor.
- Paper: The label (with the liner attached) in the sensor.

Follow the steps below to perform a Standard Calibration:

Step	Action	Displayed Message	Comment
1	Turn 'On' the printer. Wait until the printer initializes (about six seconds).	**CANNOT CALIBRATE** *-Or-* **UNCALIBRATED**	(Media should be loaded and the 'Sensor Type' set.)
2	Press the MENU Key.	**MEDIA SETTINGS**	The Menu Window will appear.
3	Press the ENTER Key.	**MEDIA TYPE**	See Section 4.2.2 for menu items.
4	Press the ↓ Key to scroll to 'Sensor Calibration'.	**SENSOR CALIBRATION**	Press the ESC Key to abort this procedure.
5	Press the ENTER Key.	**PERFORM CALIBRATION**	You are beginning the calibration procedure.
6	Press the ENTER Key. Remove the media from the Media Sensor then press any key.	**REMOVE LABEL STOCK** **PRESS ANY KEY <yyy>**	Sets the 'empty' value - where 'yyy' is a numerical value representing the current sensor reading.

Standard Calibration (continued)

Step	Action	Displayed Message	Comment
7	Proceed according to the type of media being calibrated: **Die-cut:** a) Remove a label or two from the liner material. b) Reinstall the media. c) Place only the liner under the sensor. d) Position the Eye Mark over the middle of the liner. e) Press any key. **Notched:** a) Position the Eye Mark over the center of the notch. b) Press any key. **Reflective:** a) Position the Sensor Eye Mark over the center of the black mark. (The black mark should face down in the printer.) b) Press any key. **Continuous:** Go to Step 8.	**SCAN BACKING** **PRESS ANY KEY <yyy>** *- Or, for reflective media:* **SCAN MARK** **PRESS ANY KEY <yyy>**	Sets the 'gap' (or 'mark') value - where 'yyy' is a numerical value representing the current sensor reading. ☑ ***Note:*** *Never position a perforation under the sensor when recording a sensor reading.*
8	Position a label (and backing, if any) under the Eye Mark; see Section 3.5. Press any key to continue.	**SCAN PAPER** **PRESS ANY KEY <yyy>**	This sets the parameter for the 'paper' value - where 'yyy' is a numerical value representing the current sensor reading. ☑ ***Note:*** *If using preprinted stock, ensure that the label area under the sensor is free of preprinted text, graphics or borders.*

Standard Calibration (continued)

☑ ***Note:*** *Do not move the position of the Media Sensor after it has been adjusted.*

Step	Action	Displayed Message	Comment
9	Observe the display.	**GAP MODE CALIBRATION COMPLETE** *- Or, for reflective media:* **REFLECTIVE MODE CALIBRATION COMPLETE** *- Or, for continuous media:* **CONTINUOUS MODE CALIBRATION COMPLETE**	The calibration was successful. ☑ ***Note****: If 'Warning Low Backing' is displayed (most typical with notched media or media on a transparent liner), the message indicates that calibration was successful. For other possible messages see Section 6.2.*
10	Press the ESC Key to exit the menu. If using gap or reflective media, press and hold the FEED Key.	**READY**	*Allow the printer to output at least two labels.* The printer is ready to begin printing.

5.1.3 Advanced Entry Calibration

Advanced Entry Calibration is an alternate calibration method for special-case media types. This is a two-part procedure: (1) recording the sensor readings for the label using differing algorithms; and, (2) selecting the best result, re-sampling, and then entering those values.

> ☞ *Advanced Entry Calibration will override all previous calibration settings. Use this method ONLY if the Standard Calibration procedure has failed.*

Follow the steps below to perform an Advanced Entry Calibration:

Step	Action	Displayed Message	Comment
1	Turn 'On' the printer. Wait until the printer initializes (about six seconds).	**CANNOT CALIBRATE** *-Or-* **UNCALIBRATED**	(Media should be loaded and the 'Sensor Type' set.)
2	Press the MENU Key.	**MEDIA SETTINGS**	The Menu Window will appear.
3	Press the ENTER Key.	**MEDIA TYPE**	See Section 4.2.2 for menu items.
4	Press the ↓ Key to scroll to 'Sensor Calibration'.	**SENSOR CALIBRATION**	Press the ESC Key to abort this procedure.
5	Press the ENTER Key.	**PERFORM CALIBRATION**	You are entering the calibration submenu.
6	Press the ↓ Key to scroll to 'Advanced Entry'.	**ADVANCED ENTRY**	You are entering Advanced Entry Calibration.
7	Press the ENTER Key.	**SENSOR LEVELS**	Press the ESC Key to abort this procedure.
8	Press the ↓ Key.	**SENSOR GAIN**	You are beginning the Advanced Entry Calibration.

Step	Action	Displayed Message	Comment
9	Press the ENTER Key. Place the label under the Sensor Eye Mark and lower the Head Lift Lever.	**GAIN TRAN <yyy>** ***00 <0 – 32>** *- Or, for reflective media:* **GAIN REFL <yyy>** ***00 <0 – 32>**	If using preprinted media, ensure the label area under the sensor is free of text, graphics, lines, etc.
10	Press the ENTER Key to select the Gain Number (denoted by an '*') and then record the sensor reading ('yyy') as a **Label Value** in a table similar to the one shown below. Next, press the ↓ Key to increment the Gain Number. Repeat this step to find the Label Value for each of the Gain Numbers (00-32).	**GAIN TRAN <255>** ***00 <0 – 32>** *- Or, for reflective media:* **GAIN REFL <255>** ***00 <0 – 32>**	The sensor reading, where 'yyy' is a numerical value representing the current sensor reading, is useful in locating the best sensor position over the media. ☑ ***Note:*** *Never position the sensor over a perforation when recording a sensor reading.*

Sample table:

Make a table similar to the one shown right, with enough rows to record the data for each of the 33 Gain Numbers.

Gain Number	Label Value	TOF Value	Difference Value
00	255		
01			
02			
…			
32			

Step	Action	Displayed Message	Comment
11	Two Parts, A & B: **Part A:** Proceed according to your media type: ♦ Die-cut Media: a) Remove a label or two from the liner material. b) Reinstall the media. c) Place only the liner under the sensor. d) Position the Eye Mark over the middle of the liner; see Section 3.5. ♦ Notched Media: Position the Eye Mark over the center of the notch; see Section 3.5. ♦ Reflective Media: Position the Eye Mark over the center of the black mark; see Section 3.5. (The black mark must be facing down.) **Part B:** Press the ENTER Key to select the Gain Number (denoted by an '*') and then record the sensor reading ('yyy') in your table as a **TOF Value.** Next, press the ↓ Key to increment the Gain Number. Repeat Part B of this step to find the TOF Value for each of the Gain Numbers (00-32).	**GAIN TRAN <yyy>** ***00 <0 – 32>** *- Or, for reflective media:* **GAIN REFL <yyy>** ***00 <0 – 32>**	Where 'yyy' is a numerical value representing the current sensor reading: useful in locating the best sensor position. ☑ ***Note:*** *Never position the sensor over a perforation when recording a sensor reading.*

☑ ***Note:*** *Do NOT move the position of the Media Sensor after it has been adjusted.*

Step	Action	Displayed Message	Comment
12	From the data collected in Steps 10 & 11, where both the sensor readings are above 20, subtract the Label Value from the corresponding TOF Value. Record these as **Difference Values** in the table. From the resulting list, locate the largest Difference Value (see the example below). Its associated Gain Number will provide the best algorithm for your media.	**GAIN TRAN <014>** ***32 <0 – 32>** *- or, for reflective media:* **GAIN REFL <014>** ***32 <0 – 32>**	Both sensor values must be above 20.

For example, if your compiled data had the values shown in this table, Gain Number 8 would be chosen because it has the highest Difference Value (146), where both the Label Value and the TOF Value are above 20.

Gain Number	Label Value	TOF Value	Difference Value
00	255	254	1
01	251	240	11
02	241	213	28
03	231	182	49
04	219	150	69
05	212	119	93
06	200	88	112
07	189	58	131
08	178	32	146
09	167	19	N/A
10	156	17	N/A
…	…	…	…
31	116	14	N/A
32	112	14	N/A

Step	Action	Displayed Message	Comment
13	Using the ↓ Key, select the Gain Number determined in the previous step. Press the ENTER Key to select the setting.	**GAIN TRAN <yyy>** ***08 <0 – 32>** *- Or, for reflective media:* **GAIN REFL <yyy>** ***08 <0 – 32>**	This example uses Gain Number 8. Selection is denoted with an asterisk (*).

Step	Action	Displayed Message	Comment
14	a) Place the media in the Media Sensor. Record the sensor reading and label it 'P' (paper). b) Place the liner, mark, or notch in the Media Sensor. Record the sensor reading and label it 'G' or 'M' (Gap or Mark). c) Remove all media. Record the sensor reading and label it 'E' (Empty). (See the example below.)	**GAIN TRAN <yyy>** ***08 <0 – 32>** *- or, for reflective media:* **GAIN REFL <yyy>** ***08 <0 – 32>**	Where 'yyy' is a numerical value representing the current sensor reading.
15	Press the ESC Key followed by the ↓ Key.	**SENSOR LEVELS**	The sensor readings must now be entered into the printer.

	Paper	Gap (or Mark)	Empty
For example, at Gain Number 8, these were the sensor readings for each of the media conditions. (Actual readings will vary.)	198	084	014

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
16	a) Press the ENTER Key. b) Using the ↓ Key, set the 'Paper' level to the value determined in the previous step. c) Press the ENTER Key to set the entry (indicated by the '*') and advance the menu. d) Repeat for the 'Gap' (or 'Mark') value, and then the 'Empty' value.	**PAPER SENSOR LEVEL** **P* 198 G*000 E*000** ↓ **GAP SENSOR LEVEL** **P* 198 G*084 E*000** ↓ **EMPTY SENSOR LEVEL** **P* 198 G*084 E*014** *-Or, for reflective media:* **PAPER SENSOR LEVEL** **P* 015 G*000 E*000** ↓ **GAP SENSOR LEVEL** **P* 015 G*181 E*000** ↓ **EMPTY SENSOR LEVEL** **P* 015 G*181 E*213**	The selection will change to indicate the item for entry.
17	Press the ESC Key to exit the menu. When prompted, press the ENTER Key to save your changes and return to Ready Mode.	**SAVE CHANGES** **ENTER KEY = YES**	From 'Ready', press the FEED Key. The printer will advance the next label to the TOF position. If a problem occurs, see the note below.

☑ ***Note:*** *If the Advanced Entry Calibration fails, try the following procedure:*

Re-enter the Menu. Go to → `Media Settings` → `Calibration` → `Advanced Entry` → `Sensor Gain` and lower the selected Gain Setting number by one (to desensitize the sensor). Select the new Gain Setting, save the changes, and exit the menu. Test your media at the new setting. If necessary, repeat the procedure until a usable media setting is obtained.

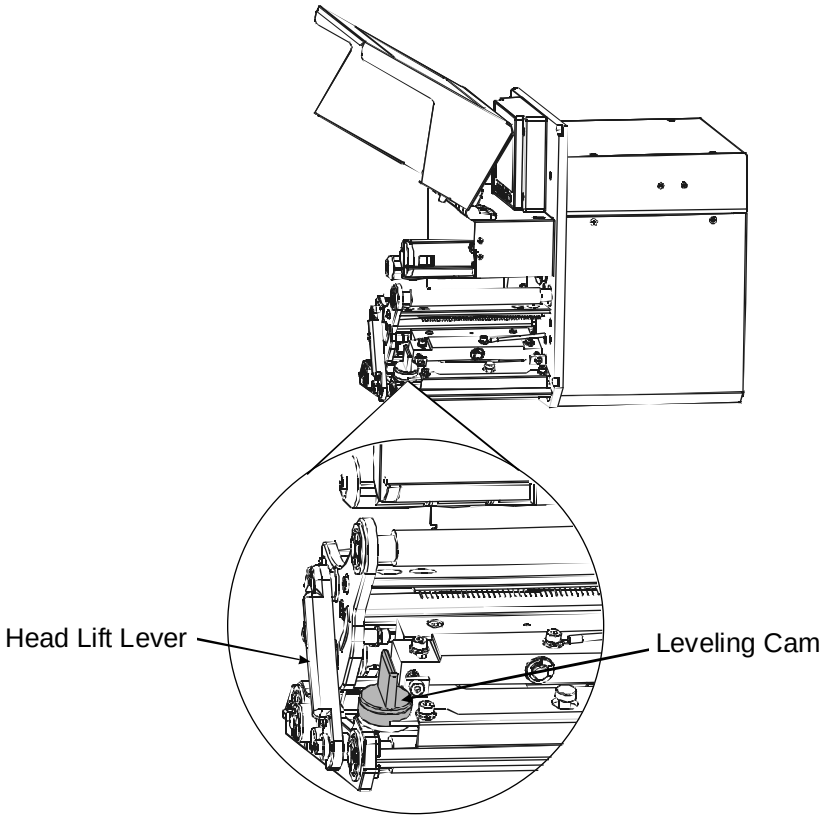
5.2 Printhead Adjustments

To ensure consistent print quality over the wide range of media types and sizes, the printer is equipped with Leveling Cam and Burn Line adjustments.

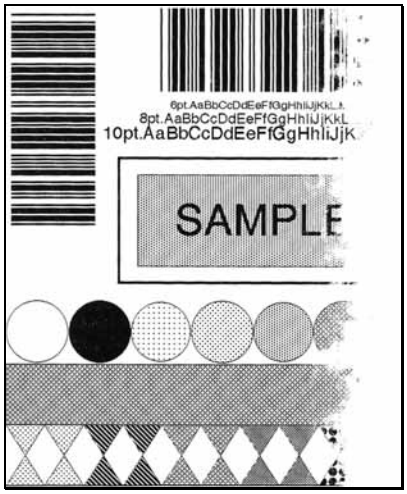
5.2.1 Leveling Cam Adjustment

The Leveling Cam adjustment should be made to ensure even print quality whenever using media that is narrower than the width of the printhead. Perform this adjustment as follows:

1. With media loaded and the Head Lift Lever locked down, download your label format to the printer (or use a resident test format, see Section 4.4). To speed the process, print a batch of labels.



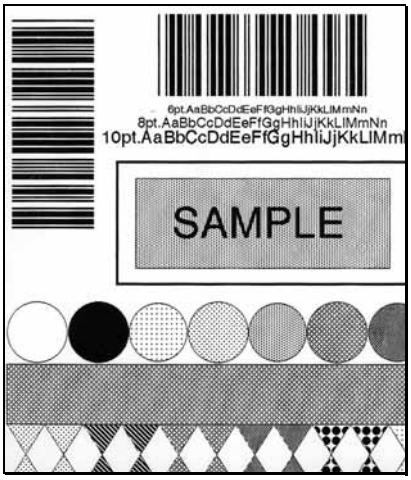
2. As the labels are being printed, rotate the Leveling Cam to an over-adjusted position (see Example 1, below).



Example 1 – Over adjustment of the cam:

Too much adjustment produces an image that fades across the label. To correct this, decrease the setting of the Leveling Cam.

3. Rotate the Leveling Cam, one click at a time, until the printed labels contain a complete, even image (see Example 2, below).



Example 2 – Correct adjustment of the cam:

Proper adjustment produces a complete image, with even print contrast across the label (see note below).

☑ ***Note:*** *Under-adjustment of the Leveling Cam can cause ribbon wrinkling, lateral label movement, and excessive wear on the printhead and platen roller.*

5.2.2 Burn Line Adjustment

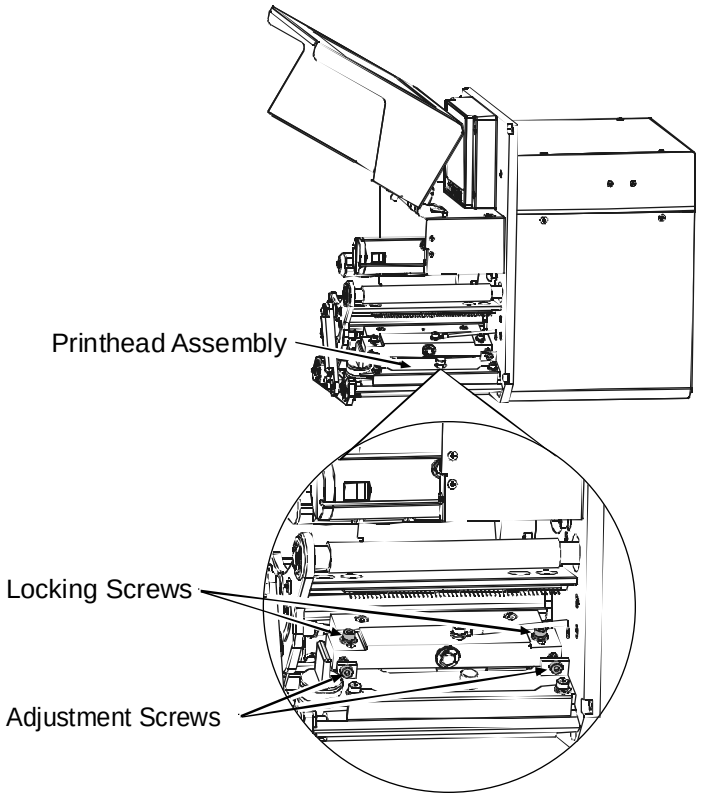
The printer has been factory-adjusted using 6.5-mil (.0065 inch) media to ensure strict print quality compliance across most types of label stock. In extreme cases, however, if media of a different thickness or rigidity is used (for example, heavy tag stock), print quality may be affected. If print quality is not acceptable, first try the suggestions in Sections 2.2, 2.3, and 5.2.1. If the problem continues, a Burn Line adjustment may be needed.

> ☞ *If you have questions, regarding this procedure contact a qualified technician or Datamax Technical Support before proceeding.*

Adjust the Burn Line as follows:

1. Load the printer with the media (and ribbon, if required), as described in Section 3.4 (and Section 3.6 for ribbon).

2. Loosen the two Locking Screws on the Printhead Assembly approximately ¼ turn counter-clockwise.



3. Turn the Adjustment Screws counter-clockwise to bring the burn line forward, beyond the vertex of the platen roller.

4. Print a Validation Label; see Section 4.4.4. (*The label should have a light, uneven appearance.*)

5. Tighten the Locking Screws until they are 'snug' (that is, tight enough to remove any play in the printhead assembly, yet loose enough to allow the Adjustment Screws to move the printhead).

6. Turn each Adjustment Screw clockwise about a ¼ turn (or 1/8 a turn for finer adjustments, see note below). (Typically, a thicker media requires a slight forward adjustment, while a thinner media requires a backward adjustment). Print another Validation Label and examine the print quality. Repeat this step until the print is produced with even contrast and acceptable quality across the width of the label.

> ☑ **Note:** *When the Locking Screws are 'snug', turning the Adjustment Screws counter-clockwise will NOT move the printhead outward. If you have adjusted the printhead too far inward, restart the entire procedure.*

7. Tighten the Locking Screws. Print a final Validation Label to verify the adjustment.

5.3 Printhead Replacement

If the printhead becomes damaged, use the procedure below to replace the component.

CAUTION

(1) Use extreme care when handling the printhead; wear a wrist strap, and follow standard ESD prevention procedures.

(2) If a voltage problem is suspected in the printhead failure (see "24V OUT OF TOLERANCE," Section 6.2) contact a qualified technician or Datamax Technical Support before proceeding.

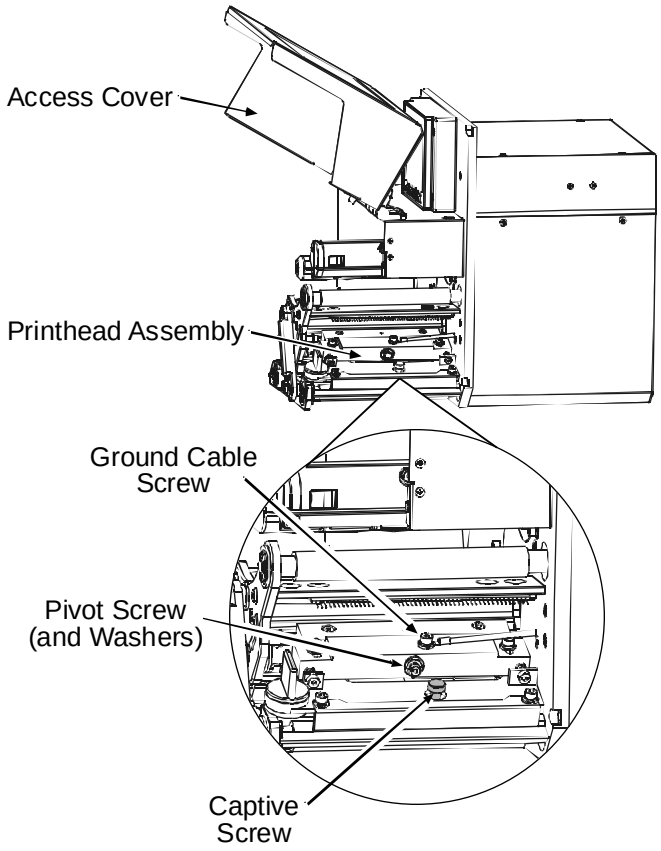
Replace the printhead as follows:

1. Turn 'Off' and unplug the printer. Raise the Access Cover.

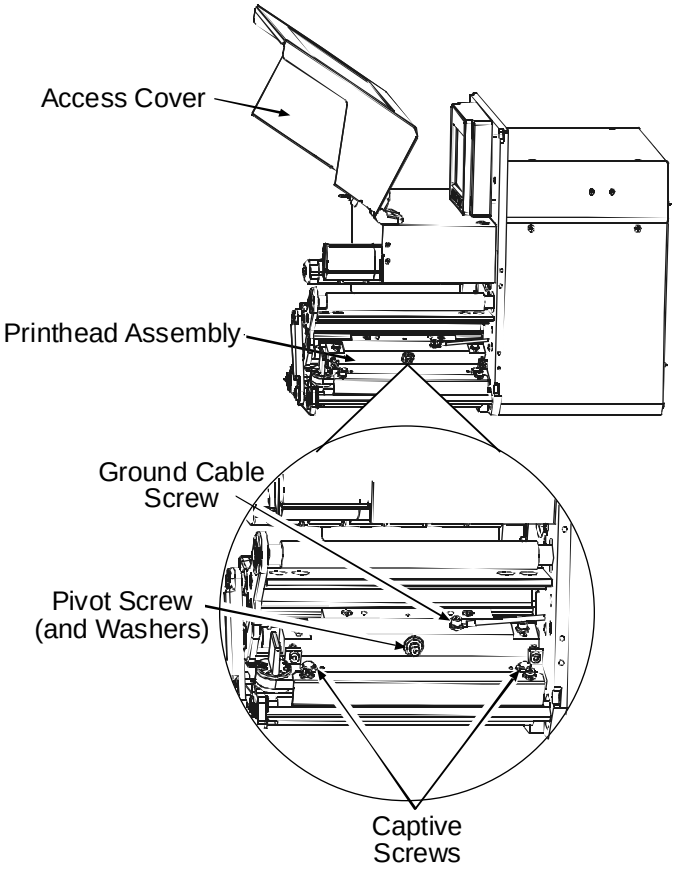
2. Touch a bare metal part of the printer's frame to discharge any static electricity that may be present on your body.

3. With the Printhead Assembly in the down position, loosen the Captive Screw(s) until the screw(s) "pop(s) up". Remove the Pivot Screw and Washers that secure the Printhead Assembly. The following drawings highlight the location of these components according to the model of the printer:

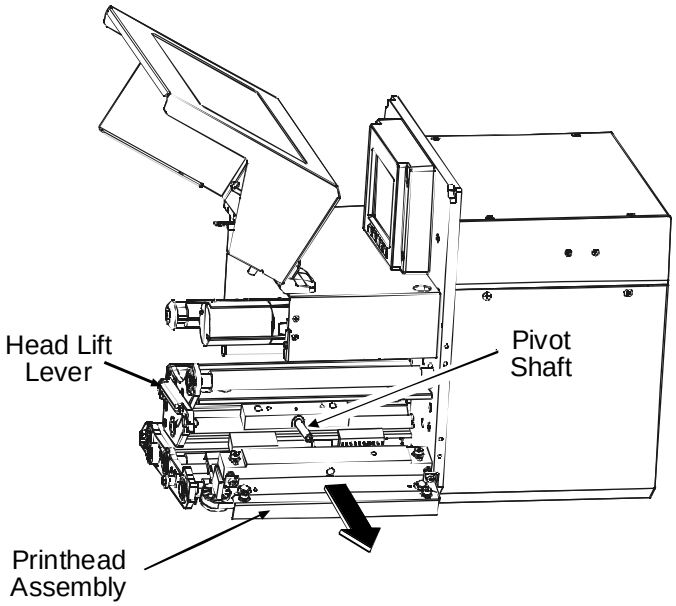
Four-inch printer models:



Six-inch printer models:



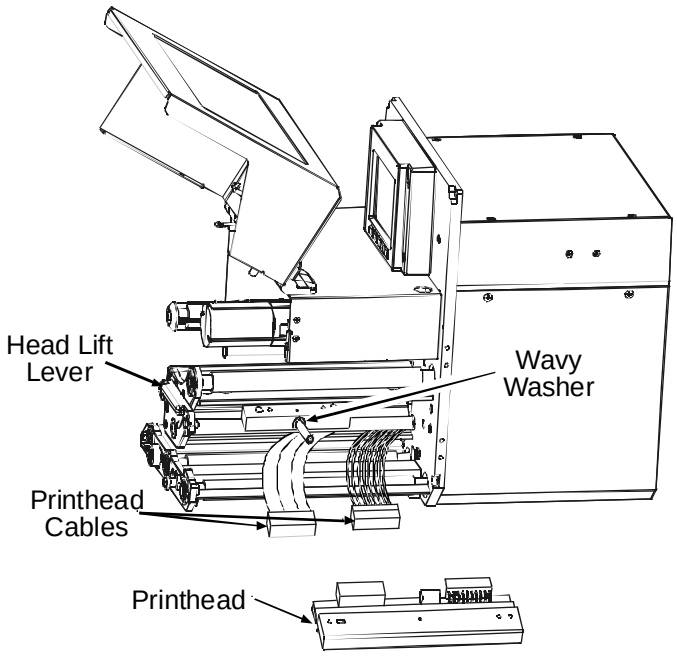
4. Raise the Head Lift Lever then slide the Printhead Assembly forward to access to the Ground Cable Screw. Remove the Ground Cable Screw then slide the Printhead Assembly off the Pivot Shaft and place the Printhead Assembly aside.



5. Carefully disconnect both Printhead Cables, and then remove the old Printhead.

6. While carefully supporting the *new* Printhead to protect its surface, connect both Printhead Cables.

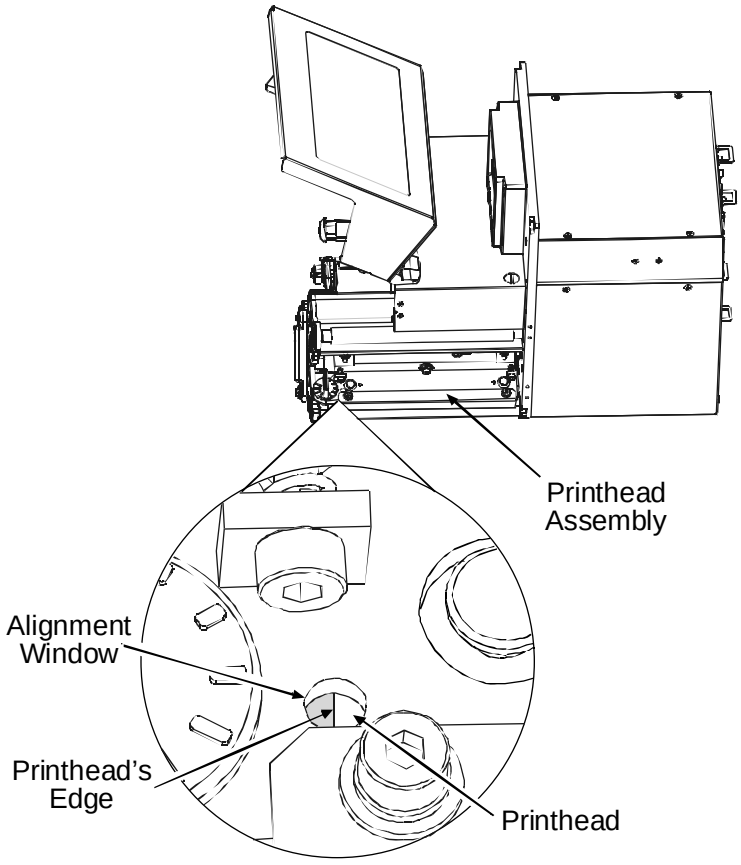
7. After ensuring that the Wavy Washer is in place, position the Printhead Assembly onto the Pivot Shaft and, using the previously removed screw, reconnect Ground Cable to the Printhead Assembly.



8. Slide the Printhead Assembly completely onto the Pivot Shaft and, using the previously removed screw and washers, secure the Printhead Asssembly.

9. Place the Printhead onto the locating pins (on the underside of the Printhead Assembly). (As a reference, use the Alignment Window in the Printhead Assembly to center the edge of the Printhead, as shown below, then move the Printhead forward or backward to locate the pins.)

☑ **Note:** *The drawing shown here is a right hand model printer. On left hand model printers, the Alignment Window can be found on the opposite end of the Printhead Assembly.*



10. Secure the Printhead with the Captive Screw(s), but do not over-tighten.

11. Clean the Printhead using alcohol and allow it to dry; see Section 5.4.1.

12. Reload media, and ribbon (if removed), lower the Head Lift Lever into the locked position. Plug in and turn 'On' the printer.

13. Print a Validation Label (see Section 4.4.4). Examine the printed label and, if necessary, adjust the Darkness setting (see Print Control / Custom Adjustments in Section 4.2.3) so that the print contrast (darkness) produced by the new Printhead matches the old Printhead.

☑ **Note:** *Following a printhead replacement, a Burn Line adjustment is NOT normally required. However, if print quality has changed, see Section 5.2.2.*

5.4 Maintenance Schedule

The following list and table detail the recommended items, techniques, and schedules to help you safely and effectively maintain the printer.

- Isopropyl alcohol
- Cotton swabs
- A clean, lint-free cloth
- Soft-bristle brush
- Soapy water/mild detergent
- Compressed air
- Printhead Cleaning Cards or Printhead Cleaning Film

For your safety and to avoid damaging the printer, turn 'Off' and unplug the printer before cleaning. Always take proper precautions when using isopropyl alcohol, a flammable liquid.

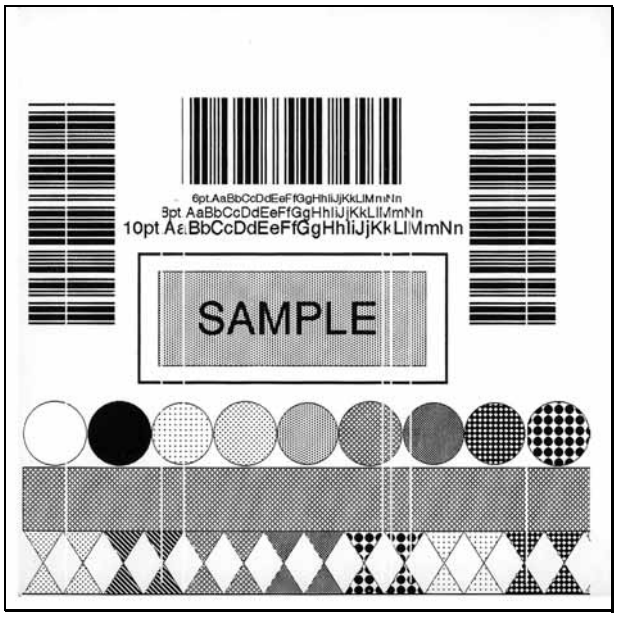
Recommended Maintenance Schedule		
Area / Item(s)	**Cleaning Interval ***	**Method / Supplies**
Printhead	Thermal transfer media – after each roll of ribbon. Direct thermal media – after each roll of media, or as needed.	Isopropyl alcohol; and, if necessary, Printhead Cleaning Cards or Printhead Cleaning Film. See Section 5.4.1.
Rollers	After each roll of labels, after each roll of ribbon, or as needed.	Cotton swab dampened with isopropyl alcohol. See Section 5.4.2.
Peel Assembly	After each roll of labels, after each roll of ribbon, or as needed.	Cotton swab dampened with isopropyl alcohol. See Section 5.4.3.
Media Path / Media Sensor / Peel Bar	As needed, based on a weekly visual inspection.	Compressed air or a soft brush. Isopropyl alcohol, as needed. See Section 5.4.4.
Exterior Surfaces	As needed, based on a weekly visual inspection.	Mild detergent. See Section 5.4.5.

*Whichever interval comes first.

5.4.1 Cleaning the Printhead

CAUTION *NEVER use a sharp object on the Printhead; damage can result.*

If print quality declines (symptoms can include unreadable bar codes, or streaks through the text and graphics), the typical cause is debris build-up on the printhead. Furthermore, if not removed, this build-up may lead to premature dot failure. Clean the printhead every time a roll of ribbon has been used. If using direct thermal stock, clean the printhead every time a roll of labels has been used, or as needed. To help you remember this important maintenance procedure, the printer can be programmed to prompt you for cleaning; see Section 4.2.2.



Faulty Label:

Instead of consistent patterns, streaks in the direction of print indicate a dirty or faulty printhead. (To print one of the resident test labels, see Section 4.4.)

According to the media, ribbon, and printing parameters used, different methods are recommended for cleaning the printhead. In all cases, perform the following preliminary operations before cleaning the printhead:

Preliminary Cleaning Steps:

1. Stop printing. Raise the Access Cover, and then raise the Head Lift Lever. **Wait a minute for the printhead to cool.**

2. Remove media and ribbon from the printer.

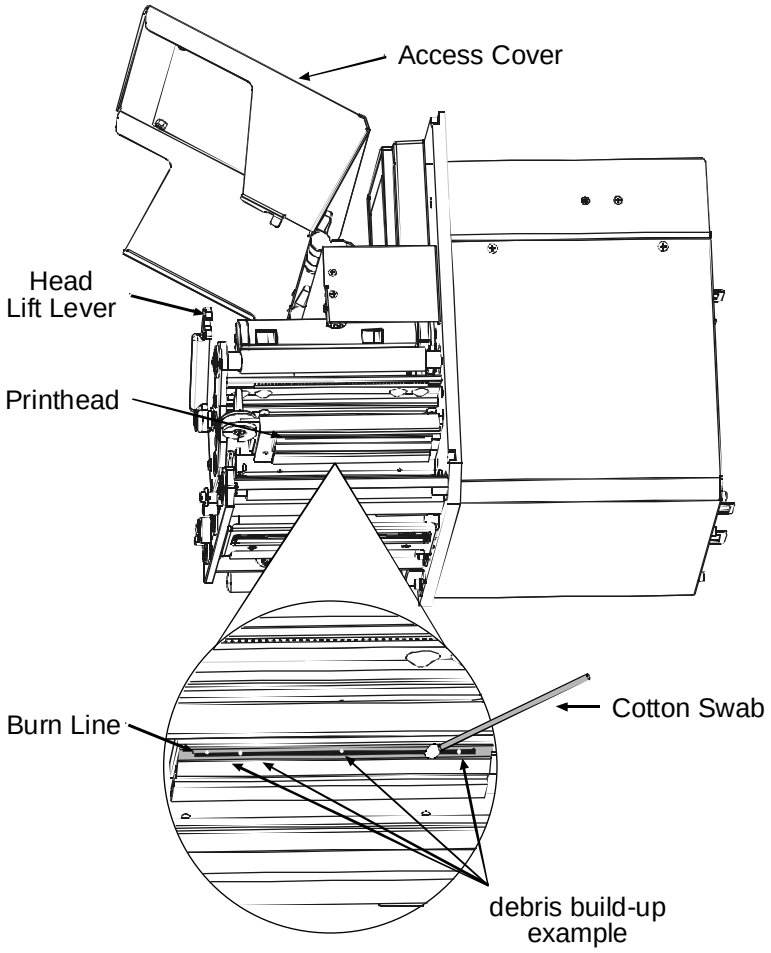
Proceed according to your cleaning requirements.

5.4.1.1 Cotton Swab Procedure

This procedure is for printers using direct thermal media, or thermal transfer media with a wax ribbon.

1. Perform the Preliminary Cleaning Steps, as described in Section 5.4.1.

2. Turn 'Off' and unplug the printer. Using a Cotton Swab moistened (not soaked) with isopropyl alcohol, gently clean the entire Printhead surface, paying special attention to the Burn Line, until all build-up is removed.



3. **Allow the printhead to dry.**

4. Reinstall media (and ribbon, if necessary). Lockdown the Head Lift Lever. If necessary, adjust the Leveling Cam. Close the cover. Plug in and turn 'On' the printer. Run a few sample labels and examine them. If streaking is still present, go to Section 5.4.1.2; otherwise, this completes the procedure.

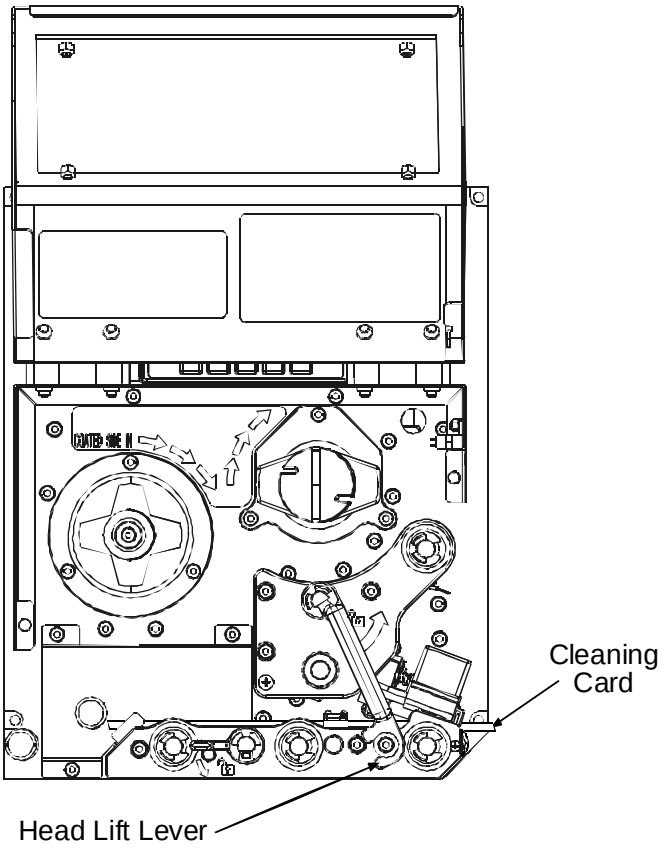
5.4.1.2 Cleaning Card Procedure

This procedure is for printers using direct thermal media, or thermal transfer media with a wax ribbon. Also use this procedure if symptoms continue after the Cotton Swab Procedure (see Section 5.4.1.1) has been tried.

1. Perform the Preliminary Cleaning Steps, as described in Section 5.4.1.

2. Place a Cleaning Card under the printhead. (Use part number 70-2013-01 for 4-inch model printers and 70-2014-01 for 6-inch model printers.)

3. Lockdown the Head Lift Lever and disengage the Leveling Cam; see Section 5.2.1.



4. Close the access cover. Press and hold the TEST Key for approximately four seconds. (As an alternate, '`CLEAN HEAD NOW`' can be selected in the menu system, see Section 4.2.2.)

5. After the cleaning card has been run through the printer, reinstall media (and ribbon, if necessary). Lockdown the Head Lift Lever. If necessary, adjust the Leveling Cam. Close the cover. Run a few sample labels and examine them. If streaking is still present, go to Section 5.4.1.3; otherwise, this completes the procedure.

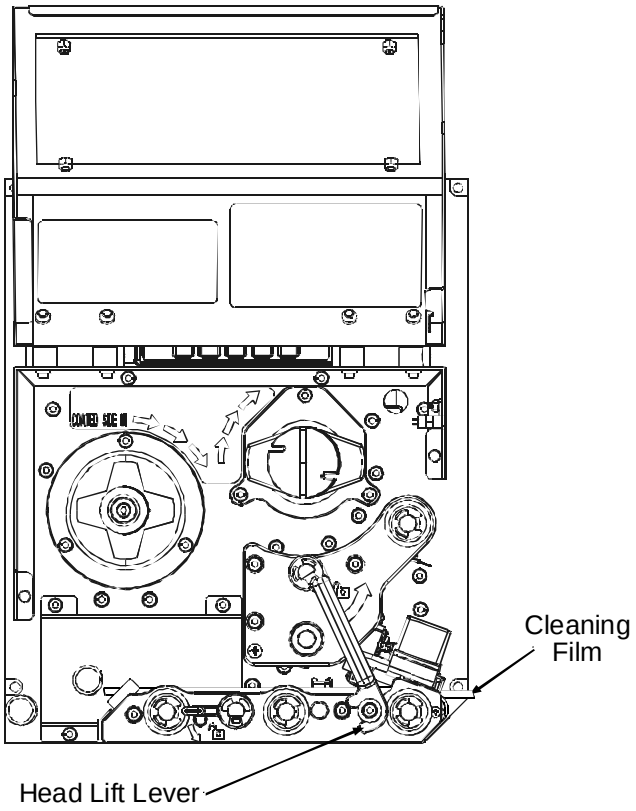
5.4.1.3 Cleaning Film Procedure

This procedure is for printers using a resin ribbon with thermal transfer media, or for printers that typically use a Heat Value of 22 or higher. Also use this procedure if symptoms continue after the previous method (see Section 5.4.1.2) has been tried.

1. Perform the Preliminary Cleaning Steps, as described in Section 5.4.1.

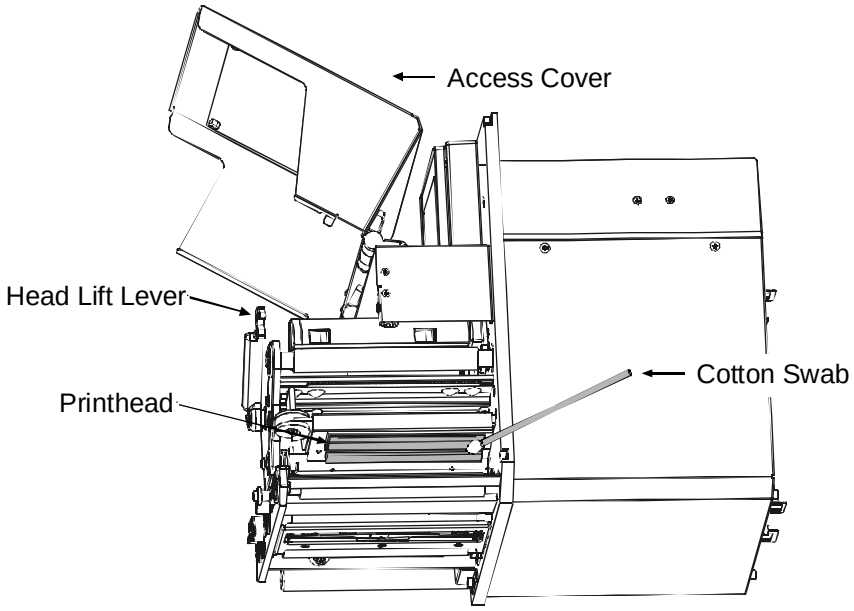
2. Place a sheet of Cleaning Film under the printhead. (Use part number 70-2087-01 for 4-inch model printers; or, 70-2087-02 for 6-inch model printers.)

3. Lockdown the Head Lift Lever and disengage the Leveling Cam; see Section 5.2.1.



4. Close the access cover. Press and hold the TEST Key for approximately four seconds. (As an alternate, 'CLEAN HEAD NOW' can be selected in the menu system, see Section 4.2.2.)

5. After the cleaning film has been run through the printer, turn 'Off' and unplug the printer. Open the Access Cover and raise the Head Lift Lever. Using a cotton swab moistened (not soaked) with isopropyl alcohol, gently clean the entire Printhead surface. **Allow the printhead to dry.**



6. Reinstall media and ribbon. Lockdown the Head Lift Lever. If necessary, adjust the Leveling Cam. Close the cover. Plug in and turn 'On' the printer. Run a few sample labels and examine them; if streaking is still present, see Section 6.1.

5.4.2 Cleaning the Rollers

CAUTION

NEVER use a sharp object to clean the Rollers.

Rollers contaminated with grit, label adhesive, or ink can cause a reduction in print quality. Label tracking can also be affected. In extreme cases, labels may wrap the rollers. To prevent problems, clean the rollers as follows:

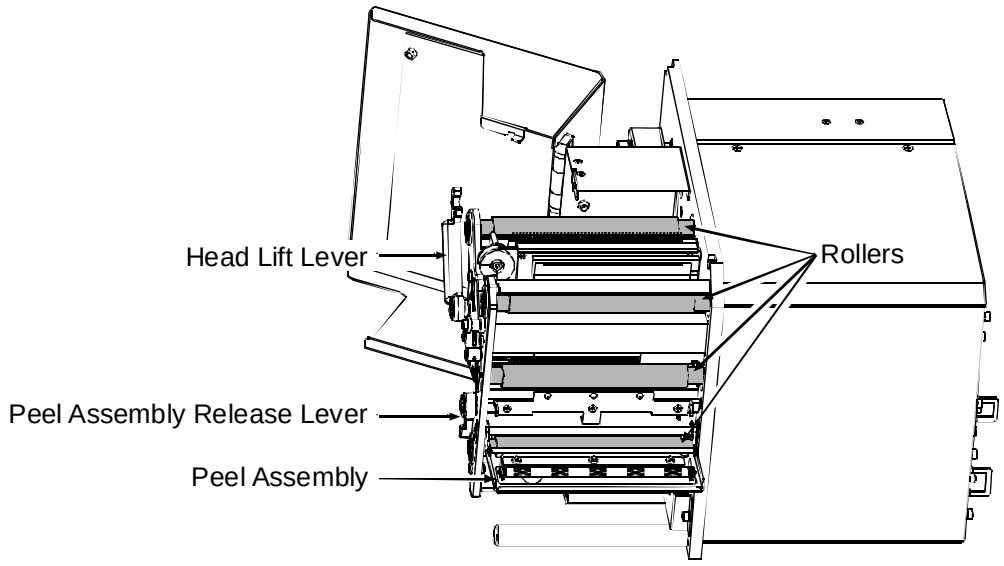
1. Turn 'Off' and unplug the printer. Raise the access cover.

2. Raise the Head Lift Lever. Lower the Peel Assembly Release Lever. Remove media and ribbon.

3. Using a cotton swab dampened with isopropyl alcohol, clean the Rollers. Rotate each roller, wiping and repeating until the entire roller is clean.

4. After allowing the Rollers to dry, replace ribbon and media. Close the Peel Assembly and lower the Head Lift Lever into the locked position.

5. Close the access cover. Plug in and turn 'On' the printer. *This completes the cleaning procedure. Feed several labels to normalize media tracking.*

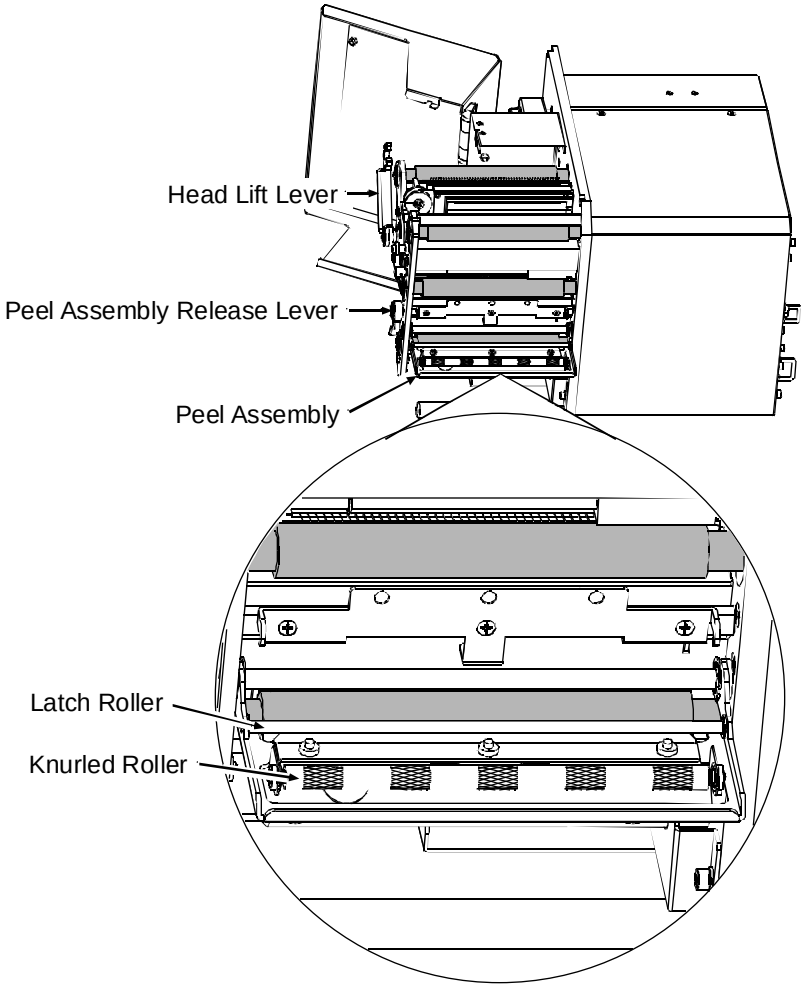


5.4.3 Cleaning the Peel Assembly

Peel Rollers contaminated with grit and label adhesive can reduce the ability of the printer to separate the labels from the backing material. To prevent problems, clean the rollers as follows:

1. Turn 'Off' and unplug the printer. Raise the access cover.

2. Raise the Head Lift Lever. Lower the Peel Assembly Release Lever. Remove media and ribbon.



3. Using a cotton swab dampened with isopropyl alcohol, clean the Latch Roller and the Knurled Roller. Rotate each roller, wiping and repeating until each entire roller is clean.

4. After allowing the rollers to dry, replace ribbon and media. Close the Peel Assembly and lower the Head Lift Lever into the locked position.

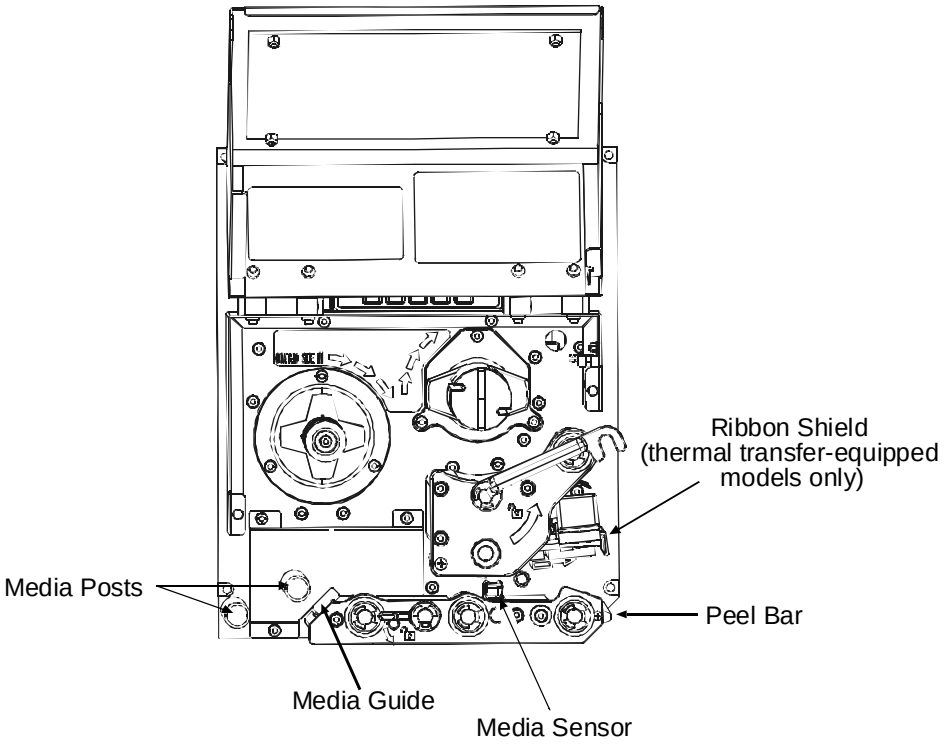
5. Close the access cover. Plug in and turn 'On' the printer. *This completes the cleaning procedure. Feed several labels to normalize media tracking.*

5.4.4 Cleaning the Media Sensor, Media Path, and Peel Bar

When particles such as paper dust accumulate inside the printer, the result can produce small voids in the text, graphics and bar codes. Also, adhesive build-up on the Peel Bar can impair label separation. To prevent problems, clean these areas as follows:

1. Turn 'Off' and unplug the printer. Raise the access cover.

2. Raise the Head Lift Lever. Lower the Peel Assembly Release Lever. Remove media and ribbon.



3. Using compressed air or a soft brush, clean the media path (and ribbon path, on units equipped with the thermal transfer option) including the Media Sensor and Peel Bar. Use a cotton swab dampened with isopropyl alcohol as needed on areas of heavy build-up.

4. After allowing the components to dry, replace media, and ribbon (if needed). Close the Peel Assembly and lower the Head Lift Lever into the locked position.

5. Close the access cover. Plug in and turn 'On' the printer. *This completes the procedure. Feed several labels to normalize media tracking before printing.*

5.4.5 Cleaning Exterior Surfaces

The stainless steel surfaces of the printer should be cleaned using a general-purpose cleanser. Never use abrasive cleansers or solvents. Clean the printer surfaces as follows:

1. Turn 'Off' and unplug the printer.

2. Using a soft cloth or sponge dampened with the cleanser, wipe the exterior surfaces clean.

3. Allow the surfaces to dry.

4. Plug in and turn 'On' the printer.

5.5 Application Program Updates

The printer stores its application program in Flash memory on the Main Logic Card. The printer allows updates to this program version through any of its communications interfaces. Updates can be found at ftp://ftp.datamaxcorp.com

Before updating, identify the current version of the printer's application program by printing a Configuration Label (see Section 4.4.2). Compare that version string to those filenames available from the FTP site (see above) and then download the desired file onto your computer's hard drive.

WARNING

Should an error occur during the download (see Section 5.5.2), the update is aborted. If this process did not reach 'Erasing Flash' or 'Updating Software', the previous program is left intact; otherwise, a successful download must be completed before the printer is operable.

5.5.1 Updating the Application Version

☑ **Note:** *If Security has been enabled, disable the feature before proceeding (see Section 4.2.5).*

Step	Displayed Message	Operator Action	Comment(s)
1	**READY**	Using the DOS copy command (where 'filename' is the program to be loaded and 'lpt1' is the selected interface port), enter the following: copy filename lpt1:	As an example, this would be entered as: copy A4212tb~1.zs lpt1 (Where 'lpt1' is the host computer's port; however, this selection can differ to include a serial or other port, as the printer is equipped.) The Comm Indicator will flash as data is received.
2	**UPGRADING SOFTWARE**	No action required.	The new application program is being stored and verified.
3	**A4212 8.00 10/01/2003**	No action required.	The printer has automatically reset and is now displaying the new firmware version.
4	**READY**	No action required.	The new application is now running. ☑ **Note:** *If 'Uncalibrated' is displayed, the printer must be calibrated (see Section 5.1).*

5.5.2 Possible Problems during an Update

The following is list of possible error messages when downloading:

> ☑ **Note:** *If experiencing trouble when attempting to download the file to the printer, try the following alternate methods: 1) Windows® users – try restarting the computer in MS-DOS mode; or, 2) Use the Datamax Printer Driver (found on the Accessories CD-ROM) – "Device Setting / Send File to Printer" function.*

Application Update Error Messages	
Displayed Message	**Descriptions / Causes / Solutions**
DECOMPRESSION ERROR	The printer detected an error during the decompression and transfer of file data from cache storage into the Flash memory. Confirm the version and retry in Download Mode; however, if the problem continues call for service.
ERROR ERASING FLASH	The printer could not successfully erase Flash memory. The possible cause is defective Flash memory. Try the download again; however, if the problem continues call for service.
ERROR WRITING FLASH	The printer could not successfully write the program into Flash memory. A possible cause is defective Flash memory. Try the download again; however, if the problem continues call for service.
HARDWARE MISMATCH DATA REJECTED	Application Firmware downloaded was not compatible with the printer's Main Logic Card. The firmware used was for a different class model and not supported by this boot loader version. See Configuration Level, Section 4.2.5.
INVALID SOFTWARE DATA REJECTED	The printer detected an error in the download. The possible causes include: • An invalid or corrupted file was downloading. (Try resaving the file to the host and then download it again.) • A communications error. (Recheck the cabling and the port settings.)
SOFTWARE MISMATCH DATA REJECTED	Software level not authorized for this printer (See Section 4.2.5, Configuration Level/Printer Key.)

5.6 Boot Loader Program Updates

The printer stores the Boot Loader Program in Flash memory on the Main Logic Card. A feature allows updates to this program via the printer's interface port. Updates can be found at ftp://ftp.datamaxcorp.com.

WARNING

If power is lost while 'Upgrading Software' is displayed, the printer will become non-functional and must be returned to the factory for programming or the main logic board must be replaced.

Before performing the Boot Loader update, identify the printer's current version. Print a Configuration Label (see Section 4.4.2) and compare that version string to those available from our FTP site. Download the desired version onto your computer's hard drive. To update the Boot Loader Program:

☑ ***Note:*** *If Security has been enabled, disable the feature before proceeding.*

Step	Displayed Message	Operator Action	Comment(s)
1	**READY**	Using the DOS copy command (where 'filename' is the program to be loaded and 'lpt1' is the selected interface port), enter the following: copy filename lpt1:	As an example, this would be entered as: copy boottb~1.bs lpt1 (Where 'lpt1' is the host computer's output port; however, your selection can differ to include a serial or other port, as the printer is equipped.) The Comm Indicator will flash as data is received.
2	**UPGRADING SOFTWARE**	No action required.	The new program is being stored and verified.
3	**A4212** **3.173 4/01/2003**	No action required.	The printer has automatically reset.
4	**READY**	No action required.	The new application is now running. ☑ ***Note:*** *If 'Uncalibrated' is displayed, the printer must be calibrated (see Section 5.1).*

Troubleshooting

This section describes problem resolution, and the methods used to reset the printer.

6.1 General Resolutions

The following table covers problems that may not generate a printer error message. From the listing, locate the general description of the problem that best fits the symptom to find a solution.

> ☞ *If you have questions, or if problems persist, contact a qualified technician or Datamax Technical Support.*

If experiencing this problem…	Try this solution…
Can not communicate through the parallel port:	Watch the display. The Comm Indicator (see Section 4.1) will flash as data is received. If COMM does not appear, check the parallel cable type; also, verify the protocol and port settings of the printer and host.
The graphic display is blank, but the blue backlighting is 'On':	The display contrast may set too low. Turn the printer 'Off' and 'On.' Wait for ten seconds. (If the printer is equipped with at network card wait for two minutes.) Press and hold the MENU Key. (It can take up to 15 seconds to cycle through the contrast range, see Section 4.1 for the menu key layout.)
Erratic feeding:	The printer may require a Quick Media Calibration; see Section 5.1.1.
Erratic printing (instead of the label format, strange characters are printed):	• The printer may be in Hex Dump Mode; see Section 6.3. • If using serial communications, check the host and printer port settings; the printer may be set to eight data bits while the host is set to 7 (or vice versa).
Light print on the right or left side of the label:	• The Leveling Cam may be incorrectly adjusted; see Section 5.1.1. • The Head Lift Lever may not be locked; see Section 3.4. • The Platen Roller may be dirty or worn; see Section 5.4.2.

If experiencing this problem…	Try this solution…
Missing information in the printed label:	• Check the label format for character placement outside the dimensions of the label; all row/column values must allow enough space for the height/length of the characters and bar codes to be printed within the format size. • Available memory may have been exceeded by the requirement of the label format. Try reducing the memory allocated to either the internal module or scaleable font caches; see System Settings / Memory Settings, Section 4.2.5. • If using serial communications, ensure that the interface cable meets the requirements found in Section 3.3.1.
Missing print on left or right side of the label:	Information may be formatted outside the label dimensions. Check your software program label size or check the values in the menu for Print Control / Column Offset and Print Control / Custom Adjustments / Column Adjust; see Section 4.2.3.
Unable to print rotated text:	The characters may be formatted outside the label dimensions. Ensure the row/column values provide enough room for the height of the characters or bar code to be printed. See the *Class Series Programmer's Manual* for details.
No power (the display is 'Off'):	• Verify that the AC power cord is connected to an outlet and to the printer; also, ensure the power switch is 'On'. • Verify that the AC outlet is functioning, or try connecting the printer to different AC circuit. • The AC cord may be damaged; replace it. • The line fuse may be blown; call for service.
Nothing is printing (labels advance normally, but no image is printed) using *direct thermal media*:	Test the labels to make sure they react to heat. If the labels do react to heat, try increasing the Heat setting (see Section 4.2.3); it may be too low. Make the adjustment in the software program or through the User Interface. (The same functional commands from the host computer may override the menu settings; see Section 4.2.6.) If the labels do not react to heat, replace the media being used with direct thermal stock.

If experiencing this problem…	Try this solution…
Nothing is printing (labels advance normally, but no image is printed) using *thermal transfer media*:	Examine the used ribbon for traces of an image. • If there <u>is</u> an image on the used ribbon: Verify that the ribbon was properly loaded per Section 3.6. If properly loaded, the ribbon is the wrong type. (To verify the inked side, press the adhesive backing of a label against the ribbon surface. Ink will only lift from the coated side of the ribbon.) Clean the printhead (see Section 5.4.1); then replace the ribbon with the correct type for the printer, Section 3.6. • If there <u>is not</u> an image on the used ribbon: Run any Test Label; see Section 4.4. If an image printed, then check the protocol and port settings for both the printer and host. These must match. The Heat setting (see Section 4.2.3) may be too low. Make an adjustment in the software program or through the User Interface. (The same functional commands from the host computer may override the menu settings; see Section 4.2.6.) The media/ribbon combination may be incorrect. Contact your Media Representative. The printhead or printhead cable(s) may be loose; power 'Off' the printer then reconnect; see Section 5.3 for locations.
Printer generated Test Labels print properly, but nothing happens when trying to print using a software program:	• Ensure that the printer is at READY. • Observe the display, if COMM is not indicated after the format is sent then check the protocol and port settings between the printer and host. • Ensure the interface cable meets the requirements found in Section 3.3.1. • Observe the display, if COMM is indicated after the format is sent then enter Menu / Communications / ESC Sequences and select the 'Disable' setting.

If experiencing this problem…	Try this solution…
Poor print quality:	• The Heat and Print Speed settings may need adjustment; see Section 2.3 for adjustment instructions. Make changes via the User Interface (see Section 4.2.3) or your software program. (Note that the same functional commands from the host software program can override the printer's menu settings. See Section 4.2.6 to disable this function.) • The media/ribbon combination may not be compatible; see Section 2.2. • The Leveling Cam may be incorrectly adjusted; see Section 5.2.1. • The Printhead may need cleaning; see Section 5.4.1. • The Platen Roller may be dirty or worn; see Section 5.4.2. • The Burn Line may need adjusting; see Section 5.2.2. • The printhead may be defective, call for service.
Skips labels when printing:	• Quick Media Calibration may be needed; see Section 5.1.1. • The Media Sensor may be out of position; readjust the position; see Section 3.5. • The format may be within 1/8 inch of the label's edge. Try reducing or moving the format slightly.

6.2 Warning and Fault Messages

All printer functions are monitored. During operation, if not within a menu system branch or Test Mode, when a potential problem (Warning) or problem (Fault) is detected the printer will display a corresponding message. Message types, along with the possible solutions, are described below.

Warning Messages:

Warning Messages are low priority messages that alert to the possibility of a problem or to a pending change in printer configuration. Warning Messages are displayed for about three seconds.

Printer Warning Messages		
Displayed Message	**Description**	**Action(s)**
DOT FAILURE	The printer has detected defective printhead elements.	Replace the printhead if the print quality becomes unacceptable.
GAP MODE WARNING LOW BACKING	There is only a small difference between the measured 'empty' and 'gap' sensor readings.	Transparent backing or notched media typically gives this indication. In this case, there may be a slight delay in the 'Out of Stock' indication, after the media supply is emptied; no action is required.
GOODBYE	Power has been removed and shutdown is in progress.	The printer power switch was turned 'Off', the line fuse has blown, or AC line voltage has been lost.
HEAD NEEDS CLEANING	The scheduled printhead cleaning distance has been reached.	Press and hold the TEST Key, or select 'CLEAN HEAD NOW'. See Section 5.4.1 for details.
HOST CHANGES PENDING	The host has pending configuration changes that will not take effect until a 'host reset command' is issued.	To save your changes, send a host reset command (in DPL), or to discard changes perform a soft reset; see Section 6.4.1.
LOW VOLTAGE	The printer has detected a low operating voltage.	Possible low or fluctuating line voltage level. Try moving the printer to another outlet. If the condition persists, call for service.
RTC RAM FAILURE	The printer was unable to save settings in permanent memory.	Possible faulty Main Logic Card. If the condition persists, call for service.
TEMPERATURE PAUSE	A high printhead temperature has been detected.	No action required. Printing will resume after the printhead cools.

Fault Messages:

Fault Messages are high priority messages to alert to an error condition in the printer. If more than one fault is detected, the display will cycle the different messages.

☑ ***Note:*** *To return to normal operation following a fault, the fault must be corrected and then the FEED Key must be pressed to clear the condition.*

Printer Fault Messages		
Displayed Message	**Description**	**Possible Solution(s)**
24V OUT OF TOLERANCE	The printer has detected a drop in the 24-volt power supply.	Try cycling the printer power 'Off' and 'On'. If the fault does not clear, call for service.
ADC FAULT	The printer has detected an analog to digital circuit converter failure.	Try cycling the printer power 'Off' and 'On'. If the fault does not clear, call for service.
DMA FAULT	The printer has detected a Direct Memory Access failure.	Try cycling the printer power 'Off' and 'On'. If the fault does not clear, call for service.
GAP MODE CANNOT CALIBRATE	The printer has detected consistently low sensor readings for the media.	Press any key to continue. Ensure that media was inserted in the media sensor during the appropriate calibration step; also ensure that the sensor is clean. Retry the calibration. If the problem persists, try the 'Advanced Entry Calibration'; see Section 5.1.3.
GAP MODE FAULTY SENSOR	The printer has detected consistently high sensor readings for the media.	Press any key to continue. Ensure that media was removed from the media sensor during the appropriate calibration steps; also ensure that the sensor is clean. Retry the calibration. If the problem persists, call for service.
HEAD CLEANING FAULT	The scheduled printhead cleaning has been exceeded by an amount equal to three times the pre-programmed distance.	Press and hold the TEST Key, or select 'CLEAN HEAD NOW'. See Section 5.4.1 for details.
HEAD/COVER UP FAULT	The printhead is in the 'up' position or the Cover Sensor is open.	Lower and lock the Head Lift Lever (see Section 3.4); or, close the Access Cover.

Printer Fault Messages *(continued)*		
Displayed Message	**Description**	**Possible Solution(s)**
OUT OF STOCK	The printer cannot detect media.	Try the following: 1) Load media; see Section 3.4. 2) Ensure that the labels are passing through the Media Sensor, and that the Media Sensor is positioned over the media; see Section 3.5. 3) If using media with large gaps, adjust the Paper Out Distance; see Section 4.2.2. 4) Calibrate the printer; see Section 5.1.
POSITION FAULT	Three possible causes: (1) An update was made to the Application Version of the firmware; (2) the printer was powered-off or reset during a ribbon, out of stock or TOF fault; or (3) the printer was unable to complete the Media Calibration.	Depending upon the cause: (1) Press the FEED Key in an attempt to identify and then clear the fault; or (2) If necessary, calibrate the printer; see Section 5.1.
PRINT ENGINE FAULT	The printer has detected a problem within the print logic.	Try cycling the printer power 'Off' and 'On'. If the fault does not clear, call for service.
RAM FAULT	The system has detected a RAM failure.	Try cycling the printer power 'Off' and 'On'. If the fault does not clear, call for service.
REFLECTIVE MODE CANNOT CALIBRATE	Consistently low sensor readings were detected.	Press any key to continue. Ensure that the reflective mark was inserted facedown in the media sensor during the appropriate calibration step; also, ensure that the reflective mark is made of carbon based ink, and that the sensor is free of debris. Retry calibration. If the problem persists, try an 'Advanced Entry Calibration'; see Section 5.1.3.

Printer Fault Messages *(continued)*		
Displayed Message	**Description**	**Possible Solution(s)**
REFLECTIVE MODE FAULTY SENSOR	Consistently high sensor readings were detected.	Press any key to continue. Ensure that media was removed from the media sensor during the appropriate calibration steps; also ensure that no labels are stuck in the media sensor. Retry the calibration. If the problem persists, call for service.
RIBBON FAULT	The ribbon sensor values have changed, or the printer detects no, or only sporadic, ribbon supply hub movement.	Try the following: 1) Ensure that ribbon is correctly installed and that the Head Lift Lever is latched. 2) Check the ribbon supply and ribbon take up hubs for obstructions that may be inhibiting movement. 3) Ensure that the ribbon core fits snugly on the ribbon supply hub. 4) Ensure that the ribbon is not slipping (usually caused by an incorrect media and ribbon combination). 5) Press and hold the FEED Key until at least three labels have been output to clear the fault.
RIBBON SAVER FAULT	The Printhead was not lifted or lowered as expected.	Enter the menu (or use software) and temporarily disable the option to continue printing. Call for service.
TEMPERATURE FAULT	The printer has shutdown to allow the printhead temperature to cool.	Turn ‘Off’ the printer and wait until the printhead cools to prevent permanent damage.

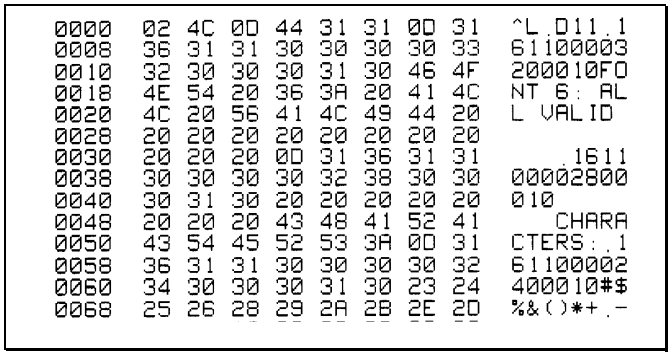
Printer Fault Messages *(continued)*		
Displayed Message	**Description**	**Possible Solution(s)**
TOP OF FORM FAULT	The printer could not find the TOF mark within the maximum label length setting or it found a TOF in an unexpected place. ☑ ***Note:*** *When the SENSOR TYPE is set to REFLECTIVE, this fault is given for an out of stock condition.*	**If media is moving:** 1) Press the FEED Key. It may be necessary to re-calibrate the printer; see Section 5.1. 2) The Media Sensor may be out of position. Readjust it; see Section 3.5. 3) The media may not be properly loaded. Reload media, also ensure that the Media Guide is positioned properly; see Section 3.4. 4) The Leveling Cam may be improperly adjusted; see Section 5.2.1. 5) The label may be longer than the default value for maximum length. Check the Media Settings / Maximum Label Length; see Section 4.2.2. 6) The Media Sensor may be obstructed. Check and carefully remove any obstruction (labels, paper dust, adhesive, etc). **If media is not moving:** The Head Lift Lever may not be latched; close and lock it.

6.3 Hex Dump Mode

The Hex Dump Mode is a useful tool for diagnosing problems, including communication and DPL™ syntax errors, allowing a comparison of input strings (sent by host) to output data (received by printer). To decode this information, the *Class Series Programmer's Manual* is an essential reference. This output can be used for debugging the label format. In addition, by repeatedly sending a format, this mode can uncover handshaking problems (if they exist). Handshaking problems are identified by sections of missing data in the character string.

To begin, go to the Diagnostics menu and enable Hex Dump Mode; see Section 4.2.7. Exit the menu and save the changes. Now, 'HEX DUMP MODE' will be indicated on the display and all data sent to the printer will now be output in hexadecimal code, along with the printable ASCII equivalents.

The figure below is a sample Hex Dump Label. After sending a label format to the printer, the hex code output will be immediate. As a final note, many software programs use bit mapping to construct the label, making diagnosis difficult. Contact Datamax Technical Support with any questions.



☑ **Note:** *To return to Ready Mode, re-enter the Diagnostics Menu and disable the Hex Dump Mode, exit the menu and save the changes.*

6.4 Resetting the Printer

Depending upon the method used, there are three possible printer reset levels:

6.4.1 Soft Reset

To clear the printer of any temporary host settings:

With the printer 'On', press and hold the CANCEL Key for approximately four seconds.

6.4.2 Level One Reset

To return the printer to factory default settings and, if saved, to restore the Factory Setting File:

1. Turn 'Off' the printer.

2. Press and hold the PAUSE and CANCEL Keys while turning 'On' the printer; continue to depress the keys until the 'SYSTEM RESET' message flashes.

> ☑ ***Note:*** *This reset has the same effect as the System Settings / Set Factory Defaults selection in the menu system. (See Section 4.2 for a listing of the factory default settings and Section 4.2.5 for information about the Factory Setting File.)*

6.4.3 Level Two Reset

To return the printer to factory default settings, and to clear all the calibration and adjustment parameters:

1. Turn 'Off' the printer.

2. Press and hold the PAUSE, FEED, and CANCEL Keys while turning 'On' the printer; continue to depress the keys until the 'SYSTEM RESET' message flashes.

> ☑ ***Note:*** *After executing a Level 2 Reset, calibration must be performed; see Section 5.1. A listing of the factory default settings can be found in Section 4.2.*

Specifications

Unless noted, the following specifications pertain to all A-Class models. References to the 'A-4xxx' denote the A-4212, A-4310, A-4408, and A-4606 models, while 'A-6xxx' denotes the A-6212 and A-6310 models.

Bar Codes (See Appendix B for details.)

Code 39, Interleaved 2 of 5, Code 128 A, B & C, Codabar, UPC-A, UPC-E, UPC 2 & 5 digit addendums, EAN-8, EAN-13, UCC/EAN Code 128 Random Weight, Code 93, MSI Plessey, Postnet, Telepen, UPS MaxiCode, PDF417, DataMatrix, Aztec, QR Code, MicroPDF417, USD 8, RSS, UCC/EAN Kmart non EDI, TLC39, EAN 128 w/auto subset switching, and Code 128 w/auto subset switching.

> ☑ **Note:** *Many bar codes carry trade names, yet they are composed of derivatives of a generic symbology structure. If you have questions regarding a specific code not found in the list above, contact Datamax for details.*

Communications/Applicator

Interfaces:

(1) Serial, EIA RS-232 DB9 and RS-422/RS-485 (configurable)

(1) Parallel, IEEE 1284 Compliant

(1) USB, Version 1.1 Compliant

(1) Serial, EIA RS-232 DB9 (Aux Port – configurable)

(1) Applicator Interface (General Purpose Input/Output Port):

Signal Inputs: Optocoupled

Voltage Outputs:

+5 VDC, fused (resettable) @ 0.75 amps

+24 VDC, fused (resettable) @ 1.6 amps

Signal Outputs: Transistor @ 20 mA maximum sinking current.

Serial –

Data Rates:	1200, 2400, 4800, 9600, 19.2K, and 38.4K baud
Handshaking:	Xon / Xoff; CTS / DTR
Parity:	Even, Odd, or None
Stop Bits:	1 or 2
Data Bits:	7 or 8

Electrical

Input Voltage:	90 – 132 / 180 – 264 VAC @ 47 – 63 Hz, auto-ranging
Grounding:	Unit must be connected to a properly grounded circuit.
Power Consumption:	A-4xxx models: 90 watts, typical operating / 10 watts, standby
	A-6xxx models: 120 watts, typical operating / 10 watts, standby

Environmental

Operating Temperature:	40° F – 100° F (4°C – 38° C)
Storage Temperature:	-40°F – 150°F (-40° C – 60° C)
Relative Operating Humidity:	10% – 90% (non-condensing)
Relative Storage Humidity:	5% – 95% (non-condensing)
Electromagnetic Radiation:	Moderate RF fields can be tolerated.
Dust:	Non-conducting, non-corrosive

Fonts (See Appendix B for examples.)

Resident:	Nine alphanumeric fonts from .035 inch (.89 mm) to 16 inches (40.5 cm) and OCR-A and OCR-B; CG Triumvirate™ from AFGA® in both Portrait and Landscape orientations (from 6 to 72 point).
Scalable:	CG Triumvirate™ and CG Triumvirate Bold Condensed™, also downloaded True Type formats.
Expansion:	All fonts expandable vertically up to 24x.
Rotation:	Fonts (and graphics) can be printed in four directions: 0°, 90°, 180°, 270°.
Character Set:	66 Selectable Code Pages (PC_850 Multilingual set by default)

☑ **Note:** *CG Triumvirate and CG Triumvirate Bold Condensed Scaleable Fonts do not support the Unicode code page.*

Mechanical

Height:	A-4xxx models:	11.81 inches (30.0 cm)
	A-6xxx models:	11.81 inches (30.0 cm)
Width:	A-4xxx models:	9.67 inches (24.6 cm)
	A-6xxx models:	9.67 inches (24.6 cm)
Depth:	A-4xxx models:	15.35 inches (39.0 cm)
	A-6xxx models:	17.35 inches (44.0 cm)
Weight:	A-4xxx models:	34 pounds (15.3 kg)
	A-6xxx models:	37 pounds (16.7 kg)

Printing

Type:	Direct Thermal, or (optional) Thermal Transfer	
Speed Ranges:	A-4212:	2 – 12 inches per second (50 – 304 MMPS)
	A-4310:	2 – 10 inches per second (50 – 254 MMPS)
	A-4408:	2 – 8 inches per second (50 – 203 MMPS)
	A-4606:	2 – 6 inches per second (50 – 152 MMPS)
	A-6212:	2 – 12 inches per second (50 – 304 MMPS)
	A-6310:	2 – 10 inches per second (50 – 254 MMPS)
Resolution:	A-4212:	203 dots per inch (8.0 DPMM)
	A-4310:	300 dots per inch (11.8 DPMM)
	A-4408:	406 dots per inch (16.0 DPMM)
	A-4606:	600 dots per inch (23.6 DPMM)
	A-6212:	203 dots per inch (8.0 DPMM)
	A-6310:	300 dots per inch (11.8 DPMM)
Nominal Dot Size:	A-4212:	.0043 X .0052 inch (.11 X .13 mm)
	A-4310:	.0027 X .0043 inch (.07 X .11mm)
	A-4408:	.0013 X .0018 inch (.05 X .07mm)
	A-4606:	.0008 X .0015 inch (.03 X .06mm)
	A-6212:	.0043 X .0052 inch (.11 X .13mm)
Maximum Print Width:	A-4212:	4.10 inches (104.0 mm)
	A-4310:	4.16 inches (105.7 mm)
	A-4408:	4.10 inches (104.0 mm)
	A-4606:	4.16 inches (105.7 mm)
	A-6212:	6.62 inches (168.1mm)
	A-6310:	6.40 inches (162.6 mm)
Media Sensing:	Movable sensor assembly.	
Length Range:	.25 – 99 inches (6 – 2500 mm)	

Printing *(continued)*

Justification: Dependant upon the model's right hand (RH) or left hand (LH) designation, where RH is right justified and LH is left justified.

Distance of media edge to printhead "Dot 1":
All RH models: .070 inch (1.78 mm)
A-4212 LH: .070 inch (1.78 mm)
A-4310 LH: 0
A-4408 LH: .070 inch (1.78 mm)
A-4606 LH: 0
A-6212 LH: 0
A-6310 LH: .054" (1.37 mm)

Printhead Protection: Thermistor sensor.

Flash Memory: 4 MB, or 8 MB (with optional Main Logic Card)

DRAM Memory: 16 MB

Media and Ribbon Requirements

Media Types: Wound-out labels only. Roll-fed, die-cut, notched, reflective continuous, and fan-fold media. Flat printable side, with no more than .0007" (.018 mm) protrusions on the opposite side. See drawing below.

Ribbon Types: 'Coated Side In' and 'Coated Side Out' types, depending upon the Ribbon Supply Hub in the printer. Types are NOT interchangeable.

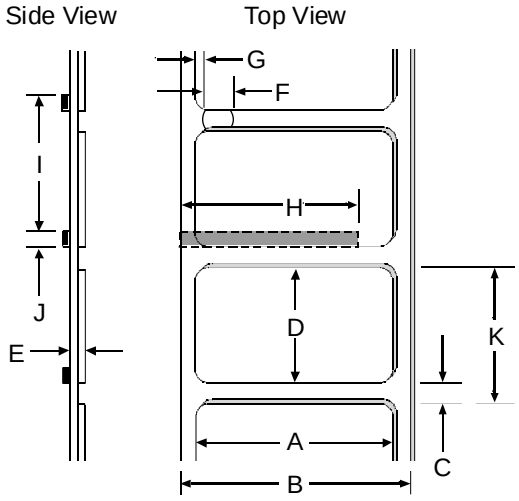
Core Size – 1.010 inches ± .006 inches (25.6 mm ± .2 mm) inner diameter core; core not to protrude beyond the ribbon's edge.

Width Range – Model dependant, where the ribbon width should slightly exceed the label width (and backing material) being used:

A-4xxx models: 1.0 – 4.65 inches (25.4 – 118.1 mm); and
A-6xxx models: 2.0 – 6.7 inches (51.8 – 170.2 mm).

Maximum Length: 1968 feet (600 meters)

Media and Ribbon Requirements *(continued)*



Media Dimensions					
Designator	**Description**	**Minimum** [1]		**Maximum** [1]	
		A-4xxx	**A-6xxx**	**A-4xxx**	**A-6xxx**
A	Label width	1.00	2.00	4.65	6.70
B	Liner width	1.00	2.00	4.65	6.70
C	Gap (or notch) between labels[3]	.100	.100	–	–
D	Label length[3]	.250	.250	.250	.250
E	Media thickness	.0025	.0025	.0100	.0100
F	Notch opening width	.200	.200	.500	.500
G	Distance from the media's edge to the media sensor aperture	.2	.1	2.25	3.35
H	Reflective (black) mark width[2]	.500	.500	4.65	6.7
I	Distance between reflective marks[3]	.500	.500	–	–
J	Reflective mark length[3]	.100	.100	–	–
K	Label repeat distance[3]	.350	.350	–	–

[1] Units of measure are given in inches and referenced by the direction of label feed.

[2] The reflective (black) mark must be carbon based, placed on the backside of the stock, and the reflectance shall be less than 10% at wavelengths of 950 and 640 nm.

[3] The maximum allowable length of the combined label and gap (or mark) measurement cannot exceed 99.99 inches.

Approved Media

Specially formulated for optimum print quality, maximum printhead life, and warranty coverage, *DATAMAX*® brand media and ribbons must be used. The use of non-Datamax materials may affect the print quality, performance, and life of the printer or its components (see the Warranty Statement). Consult Section 2.2 for an overview of media and ribbon types. For a current list of approved media and ribbons, contact a Media Representative at (407) 523-5650.

Appendix

ASCII Control Code Chart

	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ctrl @	NUL	0	00		32	20	@	64	40	`	96	60
Ctrl A	SOH	1	01	!	33	21	A	65	41	a	97	61
Ctrl B	STX	2	02	“	34	22	B	66	42	b	98	62
Ctrl C	EXT	3	03	#	35	23	C	67	43	c	99	63
Ctrl D	EOT	4	04	$	36	24	D	68	44	d	100	64
Ctrl E	ENQ	5	05	%	37	25	E	69	45	e	101	65
Ctrl F	ACK	6	06	&	38	26	F	70	46	f	102	66
Ctrl G	BEL	7	07	‘	39	27	G	71	47	g	103	67
Ctrl H	BS	8	08	(	40	28	H	72	48	h	104	68
Ctrl I	HT	9	09	)	41	29	I	73	49	I	105	69
Ctrl J	LF	10	0A	*	42	2A	J	74	4A	j	106	6A
Ctrl K	VT	11	0B	+	43	2B	K	75	4B	k	107	6B
Ctrl L	FF	12	0C	,	44	2C	L	76	4C	l	108	6C
Ctrl M	CR	13	0D	-	45	2D	M	77	4D	m	109	6D
Ctrl N	SO	14	0E	.	46	2E	N	78	4E	n	110	6E
Ctrl O	SI	15	0F	/	47	2F	O	79	4F	o	111	6F
Ctrl P	DLE	16	10	0	48	30	P	80	50	p	112	70
Ctrl Q	DC1	17	11	1	49	31	Q	81	51	q	113	71
Ctrl R	DC2	18	12	2	50	32	R	82	52	r	114	72
Ctrl S	DC3	19	13	3	51	33	S	83	53	s	115	73
Ctrl T	DC4	20	14	4	52	34	T	84	54	t	116	74
Ctrl U	NAK	21	15	5	53	35	U	85	55	u	117	75
Ctrl V	SYN	22	16	6	54	36	V	86	56	v	118	76
Ctrl W	ETB	23	17	7	55	37	W	87	57	w	119	77
Ctrl X	CAN	24	18	8	56	38	X	88	58	x	120	78
Ctrl Y	EM	25	19	9	57	39	Y	89	59	y	121	79
Ctrl Z	SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
Ctrl [	Esc	27	1B	;	59	3B	[	91	5B	{	123	7B
Ctrl \	FS	28	1C	<	60	3C	\	92	5C	|	124	7C
Ctrl]	GS	29	1D	=	61	3D	]	93	5D	}	125	7D
Ctrl ^	RS	30	1E	>	62	3E	^	94	5E	~	126	7E
Ctrl _	US	31	1F	?	63	3F	_	95	5F		127	7F

ASCII Control Code Chart *(continued)*

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ç	128	80	á	160	A0		192	C0	Ó	224	E0
ü	129	81	í	161	A1		193	C1	ß	225	E1
é	130	82	ó	162	A2		194	C2	Ô	226	E2
â	131	83	ú	163	A3		195	C3	Ò	227	E3
ä	132	84	ñ	164	A4		196	C4	õ	228	E4
à	133	85	Ñ	165	A5		197	C5	Õ	229	E5
å	134	86	a	166	A6	ã	198	C6	µ	230	E6
ç	135	87	º	167	A7	Ã	199	C7	þ	231	E7
ê	136	88	¿	168	A8		200	C8	Þ	232	E8
è	137	89	®	169	A9		201	C9	Ú	233	E9
è	138	8A		170	AA		202	CA	Û	234	EA
ï	139	8B	1/2	171	AB		203	CB	Ù	235	EB
î	140	8C	1/4	172	AC		204	CC	´y	236	EC
ì	141	8D	¡	173	AD		205	CD	´Y	237	ED
Ä	142	8E		174	AE		206	CE		238	EE
Å	143	8F	–	175	AF		207	CF		239	EF
É	144	90		176	B0	Ò	208	D0		240	F0
Æ	145	91		177	B1	D	209	D1	±	241	F1
Æ	146	92	2	178	B2	Ê	210	D2		242	F2
ô	147	93	3	179	B3	Ë	211	D3	3/4	243	F3
ö	148	94	´	180	B4	È	212	D4		244	F4
ò	149	95	Á	181	B5		213	D5		245	F5
û	150	96	Â	182	B6	Í	214	D6	÷	246	F6
ù	151	97	À	183	B7	Î	215	D7	¸	247	F7
ÿ	152	98	©	184	B8	Ï	216	D8	°	248	F8
Ö	153	99	1	185	B9		217	D9	¨	249	F9
Ü	154	9A		186	BA		218	DA	·	250	FA
Ø	155	9B	»	187	BB		219	DB		251	FB
£	156	9C		188	BC		220	DC		252	FC
Ø	157	9D	¢	189	BD		221	DD		253	FD
x	158	9E	¥	190	BE	Ì	222	DE		254	FE
f	159	9F		191	BF		223	DF	€	255	FF

Appendix

Available Fonts and Bar Codes

All character fonts and bar codes available with the printer are described in this section. Each font and bar code has a name associated with it for use in programming. Human-readable fonts have numeric names, while bar code fonts have alpha names. Consult the *Class Series Programmer's Manual* for detailed information.

Fonts

Fonts 0 through 8 use the slash zero (Ø) convention for distinguishing between the number zero and the letter O. The slash can be removed with the 'z' label-formatting command. These fonts are non-proportional (monospaced): each character takes the same amount of space for printing.

The Triumvirate font number 9 is a proportional font: each character will take up a different amount of space when printed.

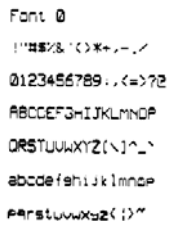
Font	Valid ASCII Characters
0	32-127, 255
1	32-168, 171, 172, 225, 255
2	32-168, 171, 172, 225, 255
3	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
4	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
5	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
6	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
7	32-126
8	32, 48-57, 60, 62, 67, 69, 78, 83, 84, 88, 90
9	32-126, 128-169, 171-173, 181-184, 189, 190, 198, 199, 208-216, 222, 224 -237, 241, 243, 246-250

The table below lists the font sizes; the numbers indicate the number of dots.

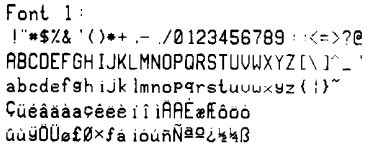
Font	Height	Width	Spacing
0	7	5	1
1	13	7	2
2	18	10	2
3	27	14	2
4	36	18	3
5	52	18	3
6	64	32	4
7	32	15	5
8	28	15	5

☑ ***Note:*** *The Euro currency character (€) has been added to Fonts 0 – 6.*

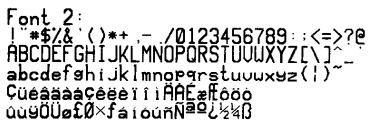
Font 0: 96-character alphanumeric, upper and lower case.



Font 1: 145-character upper and lower case alphanumeric with descenders and ascenders.



Font 2: 138-character alphanumeric, upper and lower case.



Font 3: 62-character alphanumeric, uppercase.

```
FONT 3:
#$%&()*+.-./0123456789:
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ÇÄÅÉÖÜ£ØÑ¿ß
```

Font 4: 62-character alphanumeric, uppercase.

```
FONT 4:
#$%&()*+.-./0123456789:
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ÇÄÅÉÖÜ£ØÑ¿ß
```

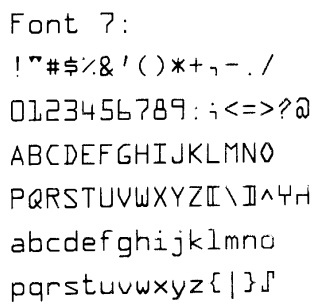
Font 5: 62-character alphanumeric, uppercase.

```
FONT 5:
#$%&()*+.-./0123456789:
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ÇÄÅÉÖÜ£ØÑ¿ß
```

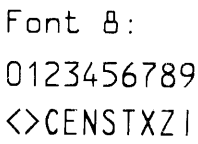
Font 6: 62-character alphanumeric, uppercase.

```
FONT 6:
#$%&()*+.-./
0123456789:
ABCDEFGHIJKL
MNOPQRSTUVWXYZ
ÇÄÅÉÖÜ£ØÑ¿ß
```

Font 7: OCR-A, size I.



Font 8: OCR-B, size III.



Font 9: Internal Triumvirate font. The number in the bar code height field sets the point sizes. Larger point sizes can be obtained by increasing the height and width multipliers.

Bar Code Summary Data

Bar Code fonts (Bar Code ID) have alpha names: Lowercase alpha names only print bar codes; uppercase alpha names print bar codes with a human-readable interpretation. Visual samples are included on the following pages. See the *Class Series Programmer's Manual* for details.

Bar Code ID	Symbology	Length	Checksum	Valid ASCII Characters, decimal value representation
A/a	Code 39	Varies	No	32, 36, 37, 42, 43, 45-57, 65-90
B/b	UPC-A	11	Yes	48-57 Numeric only. Option V used in the 6th & 7th position
C/c	UPC-E	6	Yes	48-57 Numeric only
D/d	Interleaved 2 of 5 (I2 of 5)	Varies	No	48-57 Numeric only
E/e	Code 128	Varies	M-103	32-127
F/f	EAN-13	12	Yes	48-57 Numeric only. Option V used in 7th & 8th position
G/g	EAN-8	7	Yes	48-57 Numeric only
H/h	HBIC	Varies	M-43	32, 36-39, 42, 43, 45-57, 65-90
I/i	Codabar	Varies	No	36, 43, 45-58, 65-68
J/j	Interleaved 2 of 5 w/ a modulo 10 checksum	Varies	M-10	48-57 Numeric only
K/k	MSI Plessey	Up to 14	M-10	48-57 Numeric only. Option + is last character for 2nd M-11 checksum
L/l	Interleaved 2 of 5 w/ modulo 10 checksum & bearer bars	13	M-10	48-57 Numeric only
M/m	2 digit UPC addendum	2	Yes	48-57 Numeric only
N/n	5 digit UPC addendum	5	Yes	48-57 Numeric only
O/o	Code 93	Varies	No	35-38, 42-58, 65-90, 97-122
p	Postnet	Varies	Yes	48-57 Numeric only
Q/q	UCC/EAN 128	19	Yes	48-57 Numeric only
R/r	UCC/EAN 128 K-Mart non-EDI	18	Yes	48-57 Numeric only
S/s	UCC/EAN 128 Random Weight	34 +	Yes	48-57 Numeric only
T/t	Telepen	Varies	Yes	Alphanumeric
U	UPS MaxiCode	84	Yes	Alphanumeric
u	UPS MaxiCode w/ Byte Count	Specified	Yes	Alphanumeric
v	FIM	1	No	A, B, C, D
z	PDF-417	Varies	Yes	All
Z	PDF417 w/ Byte Count	Specified	Yes	All
W1c	DataMatrix	Varies	Yes	All 8-bit values
W1C	DataMatrix w/ Byte Count	Specified	Yes	All 8-bit values
W1d	QR Code – Auto format	Varies	Yes	Alphanumeric
W1D	QR Code – Manual format	Varies	Yes	Single-byte or Kanji double-byte
W1f	Aztec	Varies	Yes	All 8-bit values
W1F	Aztec w/ Byte Count	Specified	Yes	All 8-bit values
W1G/g	USD-8 (Code 11)	Varies	Yes	45, 48-57
W1I	EAN128 (w/auto subset switching)	Varies	Yes	32-127
W1J	Code 128 (w/auto subset switching)	Varies	Yes	32-127
W1k	RSS (six types)	Varies	Yes	Numeric / Alphanumeric (type dependant)
W1R	UCC/EAN Code 128 K-MART NON EDI	18	Yes	48-57 Numeric only
W1t	TCIF Linked Barcode 3 of 9 (TLC39)	Varies	Yes	Alphanumeric
W1z	MicroPDF417	Varies	Yes	All 8-bit values
W1Z	MicroPDF417 w/ Byte Count	Specified	Yes	All 8-bit values

Barcodes samples are included below:

Bar Code A: Code 39

Bar Code B: UPC-A

Bar Code C: UPC-E

Bar Code D: Interleaved 2 of 5

Bar Code E: Code 128

Bar Code F: EAN-13

Bar Code G: EAN-8

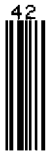
Bar Code H: Health Industry Bar Code (HBIC)

Bar Code I: Codabar

Bar Code J: Interleaved 2 of 5 w/modulo 10 checksum

Bar Code K: Plessey

Bar Code L: Interleaved 2 of 5 w/modulo 10 checksum and shipping bearer bars

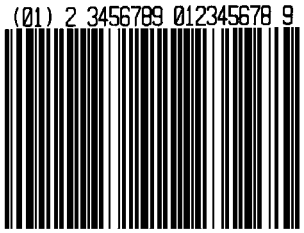


Bar Code M: 2 Digit UPC addendum

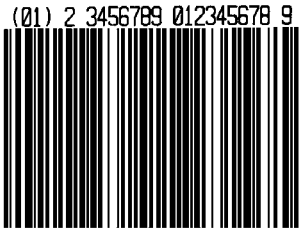
Bar Code N: 5 Digit UPC addendum

Bar Code O: Code

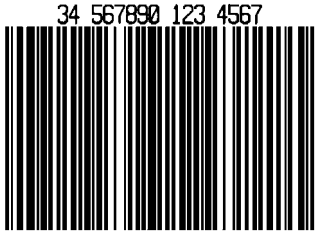
Bar Code p: Postnet



Bar Code Q: UCC/EAN Code 128



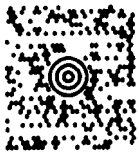
Bar Code Q: UCC/EAN Code 128



Bar Code R: UCC/EAN Code 128 KMART NON EDI

Bar Code S: UCC/EAN Code 128 Random Weight

Bar Code T: Telepen



Bar Code u: UPS MaxiCode

Bar Code v: FIM

Bar Code z: PDF-417

Bar Code W1c: DataMatrix

Bar Code W1d: QR Code

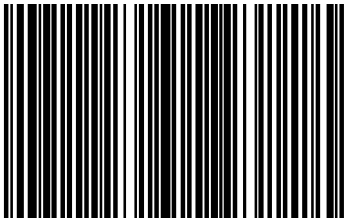
Bar Code W1f: Aztec

Bar Code W1I: EAN128 (w/auto subset switching)

Bar Code W1J: Code 128 (w/auto subset switching)

Bar Code W1k: RSS

Bar Code W1G: USD-8 (Code 11)



Bar Code W1R: UCC/EAN Code 128 K-MART NON EDI

Bar Code W1t: TLC39

Bar Code W1z: MicroPDF417

Appendix

Module Assignments

Memory Modules			
Module	**Size**	**Volatile** [1]	**Location / Total Available / Use**
D	1024 KB (Default size)	Yes	Default, as assigned in System Settings / Default Module (see Section 4.2.5) or by the <STX>X command. Main Logic Card DRAM – 1 MB Configurable. User addressable for graphics, fonts, and label formats.
G [2]	512 KB	No	Main Logic Card Flash – User addressable for graphics, fonts, and label formats.
	See Note 3, below.	No	Optional Expanded Flash Main Logic Card – User addressable for graphics, fonts, and label formats.
X	See Note 3, below.	No	Optional Expanded Flash Main Logic Card – 256KB to 6.5MB size based on ILPC Font purchased. User addressable for graphics, fonts, and label formats.
Y	128 KB	No	Main Logic Card Flash – reserved for EFIGS

[1] When power is removed from the printer, stored data will be lost.
[2] The availability/size of the internal Flash Module is dependent upon the installed Main Logic Card; reference the Configuration Label, or following the <STX>KC command the "INTERNAL FLASH MODULE PRESENT" message. The Flash memory has a limited number of writes (approximately 100,000) and is intended for permanent (or semi-permanent) storage of downloaded images, fonts and label formats.
[3] Modules G and X are partitioned to equal the sum of the total space available - 6.5MB.

Print Resolutions and Maximum Label Widths

Model	Printhead Resolution	Maximum Print Width		Factory Default Setting
		Inches	Millimeters	
A-4212	203 dots/inch (8 dots/mm)	4.10	104	4.10
A-4310	300 dots/inch (11.8 dots/mm)	4.16	105.7	4.16
A-4408	406 dots/inch (16 dots/mm)	4.10	104	4.10
A-4606	600 dots/inch (23.6 dots/mm)	4.16	105.6	4.16
A-6212	203 dots/inch (8 dots/mm)	6.62	168.1	6.62
A-6310	300 dots/inch (11.8 dots/mm)	6.40	162.6	6.40

Speed Ranges

	Speed Ranges and Defaults*			
	Range		Default Setting	
Model/Setting	IPS	MMPS	IPS	MMPS
A-4212: Print	2-12	51 – 305	8.0	203
Feed	2-12	51 – 305	8.0	203
Reverse	2-5	51 – 127	4.0	102
Slew	2-16	51 – 406	8.0	203
A-4310: Print	2-10	51 – 254	8.0	203
Feed	2-12	51 – 305	8.0	203
Reverse	2-5	51 – 127	4.0	102
Slew	2-16	51 – 406	8.0	203
A-4408: Print	2-8	51 – 203	6.0	152
Feed	2-10	51 – 254	6.0	152
Reverse	2-5	51 – 127	4.0	102
Slew	2-16	51 – 406	6.0	152
A-4606: Print	2-6	51 – 152	4.0	102
Feed	2-8	51 – 203	4.0	102
Reverse	2-5	51 – 127	4.0	102
Slew	2-16	51 – 406	4.0	102
A-6212: Print	2-12	51 – 305	8.0	203
Feed	2-14	51 – 356	8.0	203
Reverse	2-5	51 – 127	4.0	102
Slew	2-14	51 – 356	8.0	203
A-6310: Print	2-10	51 – 254	8.0	203
Feed	2-12	51 – 305	8.0	203
Reverse	2-5	51 – 127	4.0	102
Slew	2-14	51 – 356	8.0	203

*Consult the *Class Series Programmer's Manual* for detailed information.

Menu Constraint Cross-Reference

The table below highlights the menu item differences between the PE and the A-Class model printers.

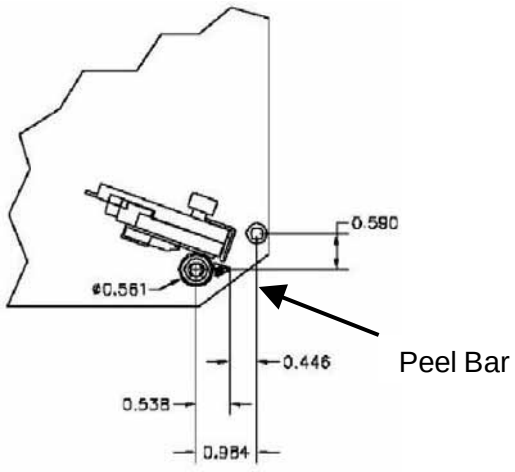
PE Menu Item	A-Class Menu Item Equivalent
Print Method	Media Type (see Section 4.2.2)
Select TOF	Sensor Type (see Section 4.2.2)
Darkness	Custom Adjustments – Darkness (see Section 4.2.3)
Start of Print	Custom Adjustments – Row Adjust (see Section 4.2.3)
Column Adjust	Custom Adjustments – Column Adjust (see Section 4.2.3)
PE Applicator Hardware	GPIO Device – Applicator and Start of Print (see Section 4.2.4)
Advanced Setup	N/A
PE Options – PE Output Signal	GPIO Device – End of Print (see Section 4.2.4)
PE Options – Backfeed Cntrl	Back After Print (see Section 4.2.5)
PE Options – Ribbon Low	GPIO Device – Ribbon Low (see Section 4.2.4)
PE Options – Exact Time Print	Imaging Mode (see Section 4.2.5)
PE Options – AUX Port GPIO	N/A. The Aux Port is now an RS-232 interface. See Communications – Serial Port B (see Section 4.2.6).
Ribbon Low Dia.	Ribbon Low Diameter (see Section 4.2.2)
Printer Model	Head Bias (see Section 4.2.5)
Counters	Media Counters (see Section 4.2.5)
Time/Date	Time and Date (see Section 4.2.5)
Label Options – Heat Setting	Heat (see Section 4.2.3)
Label Options – Print Speed	Print Speed (see Section 4.2.3)
Label Options – Backfeed Speed	Reverse Speed (see Section 4.2.3)
Label Options – Label Width	Label Width (see Section 4.2.2)
Label Options – Label Length	Label Length (see Section 4.2.2)
Label Options – Peel Position	Present Distance (see Section 4.2.3)
Label Options – Rotate Label	Label Rotation (see Section 4.2.5)
System Options – Factory Settings	Set Factory Defaults (see Section 4.2.5)
System Options – Security Check	Security (see Section 4.2.5)
System Options – Modify Password	Modify Password (see Section 4.2.5)
System Options – Internal Module	Internal Module (see Section 4.2.5)
System Options – Scaleable Font	Scaleable Font Cache (see Section 4.2.5)
System Options – Symbol Set	Single Byte Symbols (see Section 4.2.5)
Compatibility – Offset Bias	SOP Emulation (see Section 4.2.5)
Compatibility – Positioning	DPL Emulation (see Section 4.2.5)

Menu Constraint Cross-Reference (*continued*)

PE Menu Item	A-Class Menu Item Equivalent
Compatibility – Host CMDS-Ignore	See these individual menu item in Section 4.2.6: ESC Sequences, Heat Command, Speed Commands, TOF Sensing Commands, Symbol Set Command, CNTRL-Codes Data
Compatibility – Prodigy Plus Mode	DPL Emulation (see Section 4.2.5)
Operation – Pause Mode	Pause Mode (see Section 4.2.5)
Operation – Feedback Mode	Feedback Characters (see Section 4.2.6)
Operation – Test Mode	N/A
Operation – Cutter	Cutter (see Section 4.2.4)
Operation – Ribbon Saver	Ribbon Saver (see Section 4.2.4)
Operation – Conversion	Units Of Measure (see Section 4.2.5)
Communications – COMM Setup PortA	Serial Port A (see Section 4.2.6)
Communications – Control Codes	Control Codes (see Section 4.2.6)
Maintenance – Test Print	N/A
Maintenance – Front Panel	N/A
Maintenance – Test I/O	Test GPIO (see Section 4.2.7) and Sensor Readings (see Section 4.2.7)
Maintenance – Serial Loopback	N/A
Maintenance – Installed Options	Printer Options (see Section 4.2.4)
Modules – Print Directory	Print Directory (see Section 4.2.4)
Modules – Print File	Print File (see Section 4.2.4)
Modules – Copy Module	N/A
Modules – Format Module	Format Module (see Section 4.2.4)
Modules – Test Module	N/A
TOF Control OPTS	Sensor Calibration (see Section 4.2.2)

PE Peel Bar Location

This drawing has been included as a reference for users of the PE model printers. If integrating the A-Class printer into existing PE-equipped systems, compare this location to the new A-Class Peel Point detailed in Section 3.2.1.



PE to A-Class GPIO Adapter Cable

This pin-out has been included as a reference for users of PE printers who are integrating an A-Class into an existing installation. If integrating into an existing PE-equipped system, use a GPIO Adapter Cable (part number 32-2562-01) or fabricate one referencing the table below.

PE to A-Class GPIO Adapter Cable*	
PE DB9 Pin Connections	**A-Class DB15 Pin Connections**
1	2
2	9
3	10
4	NC
5	3
6	11
7	12
8	13
9	8
Case (shield)	Case (shield)

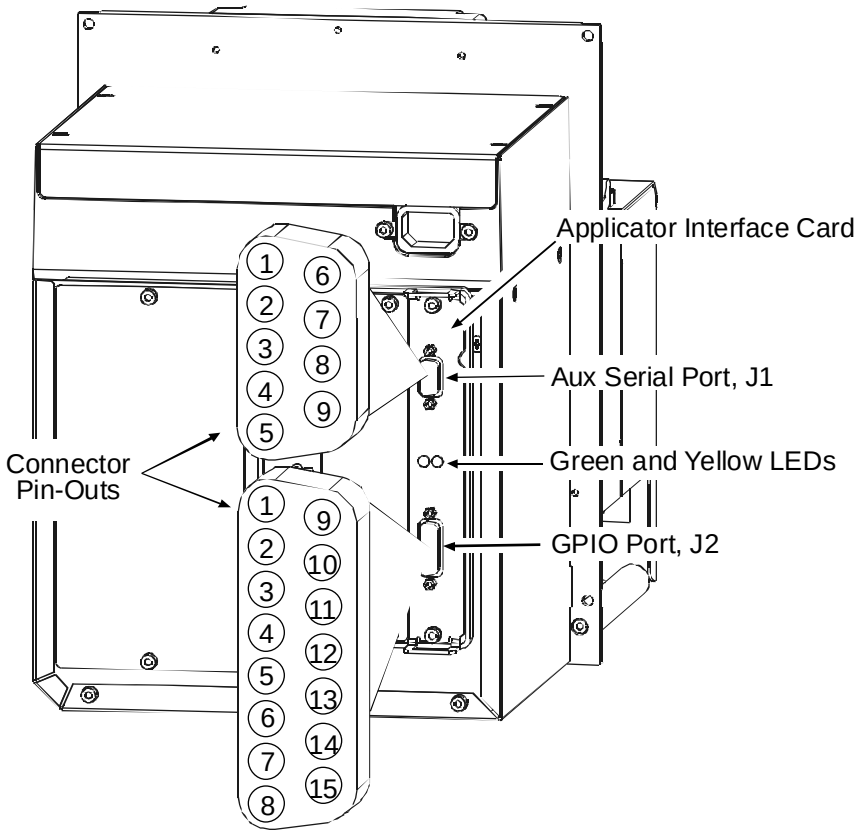
*This adapter uses a DB9 metal-shelled female connector (part numbers, 21-2757-01 & 21-2629-01); and a DB15 metal-shelled male connector (part numbers, 21-2758-01 & 21-2759-01).

Appendix

Applicator Interface Card Overview

The Applicator Interface Card, accessible from the back of the printer, contains all of the circuitry necessary to connect the printer to the applicator system. Hardware functions, pin-outs, signal descriptions and timing diagrams are given below. Other information regarding the Applicator Interface Card is arranged as follows:

- Aux Serial Port (Serial Port B) setup is detailed in Section 4.2.6.
- GPIO Port hardware setup is detailed below.
- GPIO Port operational settings are detailed in Section 4.2.4.
- GPIO Port testing and diagnostic functions are detailed in Section 4.2.7.



Green and Yellow LEDs

These indicators provide a visual check of printer/applicator activity:

- Yellow LED – Flash at power-up and when the card's outputs change state.
- Green LED – Flash at power-up and when the card's inputs change state.

Aux Serial Port (J1)

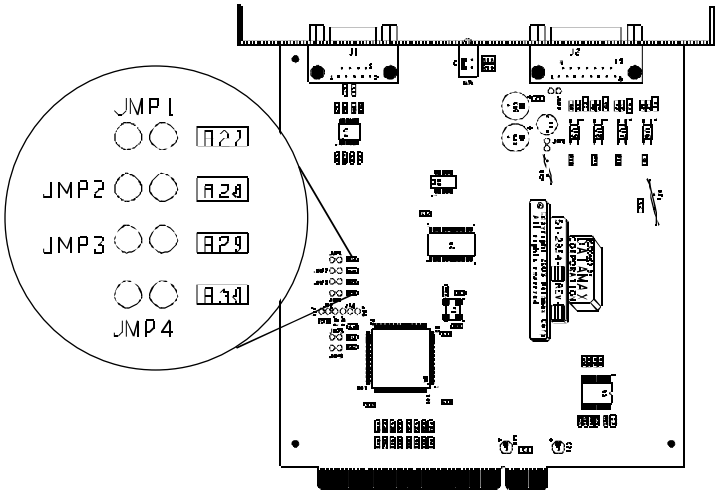
The Aux (Auxiliary) Serial Port is a 9-pin RS-232 interface. The table and drawing below are provided as a reference.

- Serial Port B users: See Section 3.3.1 for serial pin-outs and connection details of this port. Operational settings must be configured to match the device being interfaced. Settings can be made using the `COMMUNICATIONS` → `SERIAL PORT B` menu selections (see Section 4.2.6).

- Remote Display users: Reference the Installation Guide (part number 92-2384-01) of this option for more information.

CAUTION *Always wear a wrist strap and follow standard ESD prevention measures when handling the Applicator Interface Card.*

Aux Port Jumper Setting Function Assignments		
Jumper Designator	**Serial Port B**	**Remote Display option**
JMP 1	On	On
JMP 2	On	Off
JMP 3	On	On
JMP 4	On	On



Aux Serial Port (J1) Function Jumpers

GPIO Signal Info Label

A reference label showing the pin assignments and the current programmed setup information can be printed using the DIAGNOSTICS → TEST GPIO → PRINT SIGNAL INFO menu selection (see Section 4.2.7).

GPIO SIGNAL INFO
WED 11:04AM 24MAR2003
CARD ID#2

OUTPUT SIGNALS

END OF PRINT
PIN# 11
ACTIVE LOW
CURRENT LEVEL 0

RIBBON LOW
PIN# 9
ACTIVE HIGH
CURRENT LEVEL 0

SERVICE REQUIRED
PIN# 10
ACTIVE LOW
CURRENT LEVEL 1

MEDIA OUT
PIN# 12
ACTIVE LOW
CURRENT LEVEL 1

RIBBON OUT
PIN# 13
ACTIVE LOW
CURRENT LEVEL 1

DATA READY
PIN# 14
ACTIVE LOW
CURRENT LEVEL 1

INPUT SIGNALS

START OF PRINT
PIN# 3
ACTIVE LOW
CURRENT LEVEL 1

REPRINT
PIN# 6
ACTIVE LOW
CURRENT LEVEL 1

FEED
PIN# 4
ACTIVE LOW
CURRENT LEVEL 1

TOGGLE PAUSE
PIN# 5
ACTIVE LOW
CURRENT LEVEL 1

GPIO Port (J2)

The GPIO Port is a 15-pin applicator interface and requires a DB15 male connector (e.g., Startech C15PCM). The hardware and operational settings for this port must be configured for the device(s) being connected to the printer.

- Control signal logic states are programmable via the PRINTER OPTIONS → GPIO menu selections (see Section 4.2.4).
- Jumper settings select internally or externally powered interface circuitry; jumper settings also select +5 or +24 VDC signal output levels (see GPIO Interface Setup, below).

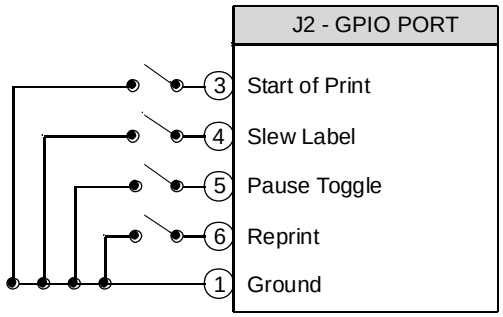
GPIO Interface Setup

Follow the steps below to setup the applicator interface:

1. Know your system's requirements for the input signal levels that will control the printer. Two different circuit suggestions are as follows:

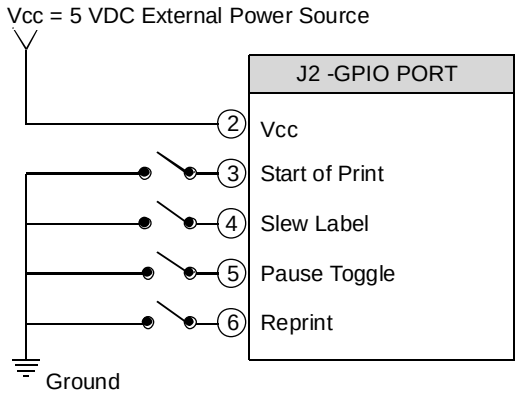
- ***Direct applicator interface:***

  This sample circuit uses the printer's +5 VDC and Ground to supply the control devices that interface to the GPIO input signal lines.



- ***Isolated applicator interface:***

  This sample circuit uses an external +5 VDC and Ground to supply the control devices that interface to the GPIO input signal lines. To use this configuration, remove JMP7 and JMP8 from the Applicator Interface Card (see Step 6, below).



2. Know your system's requirements for the output signal levels that will control the applicator. The output voltage of the printer's signal lines (such as End of Print, Data Ready, and Service Required) is selectable.

The table below details the hardware and operational functions of the GPIO Port. Note that all signal directions are given relative to the printer.

WARNING *Failure to properly configure the jumper settings of the GPIO Port may result in damage to the printer and / or the applicator.*

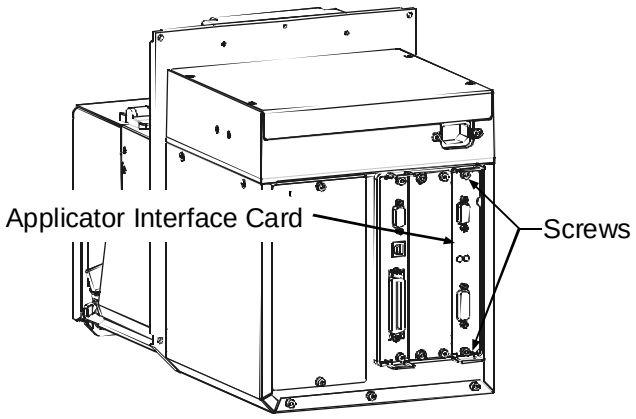
GPIO Port (J2) Pin Functions and Associated Jumper Selections					
Pin #	**Signal Name**	**Signal Direction**	**Active Setting**	**Jumper Placement**	**Function / Description**
1	Ground (Configurable)	Ground	Ground	JMP 7 'On'	Printer chassis ground is used
		Open	Open	JMP 7 'Off'	Ground Return must be supplied
2	+5 VDC (Configurable)	Output	+5 VDC	JMP 8 'On'	Printer +5 VDC is used (.5 amp max.)
		Open	Open	JMP 8 'Off'	+5 VDC must be supplied
3	Start Of Print [5]	Input	Programmable [1]	N/A	N/A
4	Slew Label [4]	Input	Low		
5	Pause Toggle	Input	Low		
6	Reprint [3]	Input	Low		
7	+24 VDC (1.0 amp max.)	Output	+24 VDC		
8	Ground	Ground	Ground		
9	Ribbon Low	Output	Programmable [1]	JMP 9: Pins 1 & 2 = +5 VDC *– OR –* Pins 2 & 3 = +24 VDC	**See WARNING message, above.** When inactive, all output pins will be pulled up to the voltage determined by this jumper setting.
10	Service Required [2]	Output	Low		
11	End Of Print	Output	Programmable [1]		
12	Media Out	Output	Low		
13	Ribbon Out	Output	Low		
14	Data Ready (DRDY)	Output	Low		
15	Spare	Output	N/A	N/A	N/A

[1] For details see Section 4.2.4.
[2] Evoked by occurrences listed under 'Fault Messages' in Section 6.2.
[3] Reprints the last label exactly, with no increment or time stamp changes; use it for error conditions. Always keeping this signal LOW will result in non-stop printing.
[4] Advances media until the signal goes HIGH and, if not in continuous mode, the media will be positioned at the next available media TOF.
[5] If active with no current print job, "WAITING FOR DATA" is displayed. Specifying a quantity of 9999 while always keeping this signal 'ON' will cause non-stop label printing, except in single label mode (see Imaging Mode, Section 4.2.5), which will cause the printer to stop between labels; see Timing Diagrams, below.

3. Make sure that the printer is turned 'Off' and that the AC Power Cord is unplugged. Also, remove any interface cable(s) attached to the Applicator Interface Card.

> ☑ **Note:** *Depending upon the configuration of your printer, the location of the Applicator Interface Card can vary.*

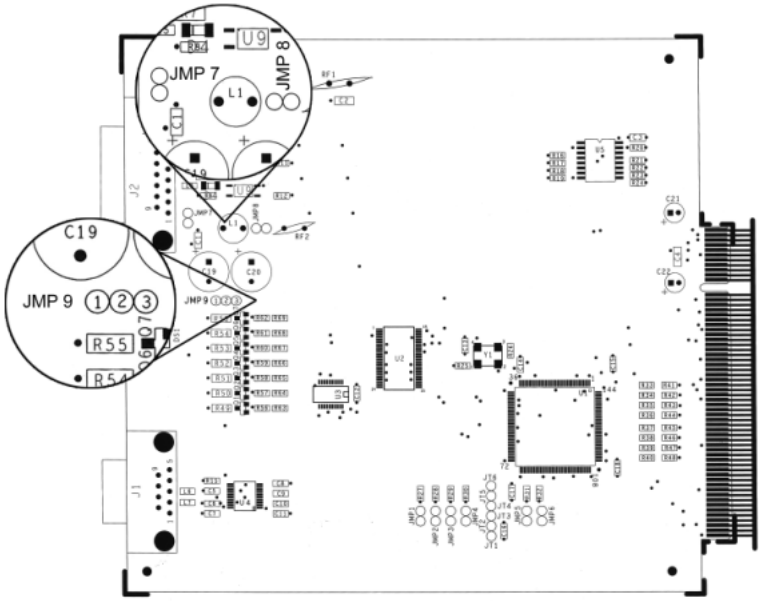
4. Remove the two Screws that secure the Applicator Interface Card to the printer.



> **CAUTION** *Always wear a wrist strap and follow standard ESD prevention measures when handling the Applicator Interface Card.*

5. Pull out the Applicator Interface Card and place it on a static-free work area.

6. Using the table above and the illustration below, configure the jumpers to meet your system's electronic requirements.



7. Slide the card back into the printer; secure it in place with the two screws.

8. Connect an applicator interface cable to J2 (and, if needed, connect a serial cable to J1).

9. Connect the power cord and turn 'On' the printer.

10. Using the Menu System, configure the operational settings of the GPIO Port to meet the requirements of your applicator system (see Section 4.2.4).

    If needed, also configure the operational settings of the Aux Serial (Serial Port B) to meet the requirements of your system (see Section 4.2.6).

11. If desired, confirm your programmed settings by printing a GPIO Signal Info Label (see Section 4.2.7). This completes the setup of the Applicator Interface Card.

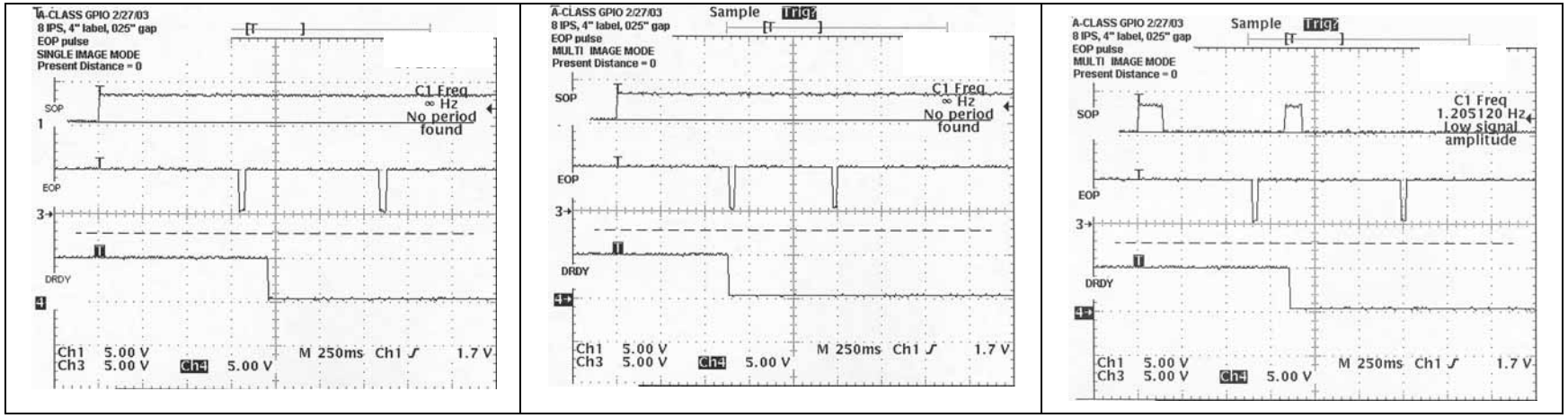
Applicator Timing Signals

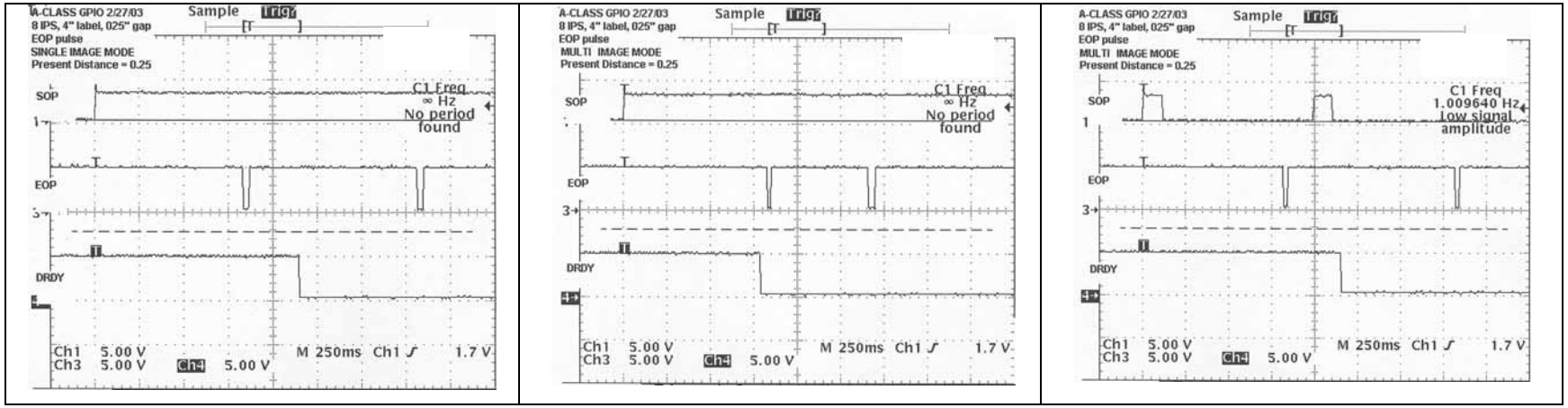
During a typical print cycle, DRDY (Data Ready) will become active when a label is waiting to be printed. After the SOP (Start of Print) signal is received by the printer, printing will begin. For synchronization with the print cycle, the EOP (End Of Print) signal indicates the completion of the print process. Screen shots of timing signals for the GPIO Interface are presented below. All sample shots were taken while printing a two-count label batch. The variable parameters were as follows:

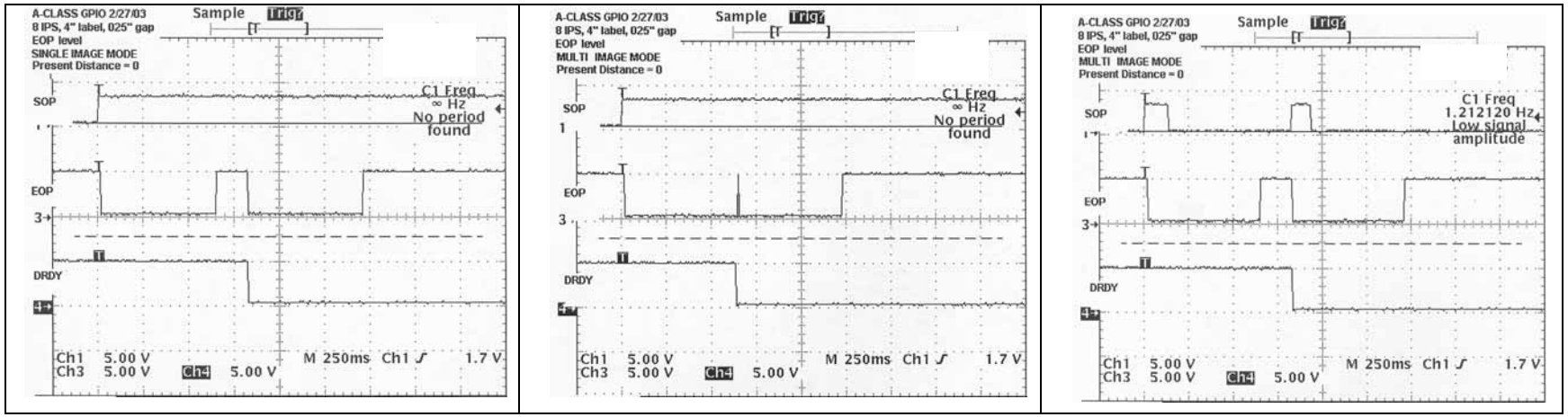
- Present Distance = 0 or .25"
- Start of Print = 'On/Off' (pulsed) or 'On'
- Imaging Mode = Single (stops) or Multi (keeps going)

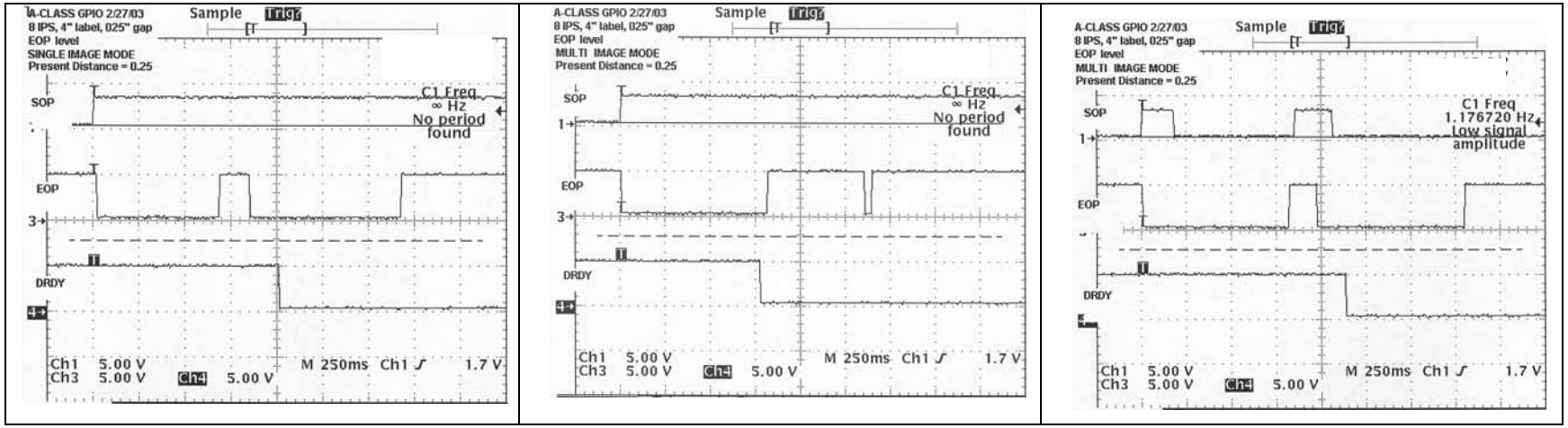
All other parameter notes accompany the respective screen shot.

> ☑ **Note:** *The printing process is not complete until the label reaches its present distance (if programmed) because a label that is presented requires addition positioning (backup) and, therefore, more time.*


A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP pulse
SINGLE IMAGE MODE
Present Distance = 0
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V
A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP pulse
MULTI IMAGE MODE
Present Distance = 0
Sample
Trig
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V
A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP pulse
MULTI IMAGE MODE
Present Distance = 0
Sample
Trig
C1 Freq
1.205120 Hz
Low signal amplitude
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V


A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP pulse
SINGLE IMAGE MODE
Present Distance = 0.25
Sample
Trig
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V
A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP pulse
MULTI IMAGE MODE
Present Distance = 0.25
Sample
Trig
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V
A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP pulse
MULTI IMAGE MODE
Present Distance = 0.25
Sample
Trig
C1 Freq
1.009640 Hz
Low signal amplitude
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V


A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP level
SINGLE IMAGE MODE
Present Distance = 0
Sample
Trig
C1 Freq
∞ Hz
No period
found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V
A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP level
MULTI IMAGE MODE
Present Distance = 0
Sample
Trig
C1 Freq
∞ Hz
No period
found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V
A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP level
MULTI IMAGE MODE
Present Distance = 0
Sample
Trig
C1 Freq
1.212120 Hz
Low signal
amplitude
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V


A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP level
SINGLE IMAGE MODE
Present Distance = 0.25
Sample
Trig
C1 Freq
∞ Hz
No period
found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V
A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP level
MULTI IMAGE MODE
Present Distance = 0.25
Sample
Trig
C1 Freq
∞ Hz
No period
found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V
A-CLASS GPIO 2/27/03
8 IPS, 4" label, 025" gap
EOP level
MULTI IMAGE MODE
Present Distance = 0.25
Sample
Trig
C1 Freq
1.176720 Hz
Low signal
amplitude
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V

Appendix

Multi-Language Menu System

This printer provides the user with the ability to download new menu system languages and/or replace the Datamax provided translations. A Microsoft® Excel Spreadsheet defines the menu dictionary – the user adds a new language column or modifies an existing column in the spreadsheet, clicks on the 'Generate DPL file(s)' radio button and sends the generated DPL file(s) to the printer.

Here are the highlights and restrictions of the feature:

- The printer can register up to 10 different display languages, including EFIGS.
- The EFIGS languages and any additional languages are stored on Module Y: a 128KB Flash Module located on the Main Logic Card.
- It is okay to download menu files generated for a lesser firmware revision to new firmware – any messages that are not defined are displayed in English.
- For the procedures below, the printer will accept the menu downloads from any available port.
- The language creation programs support Windows® 95, Windows® 98, Windows® NT, and Windows® 2000.

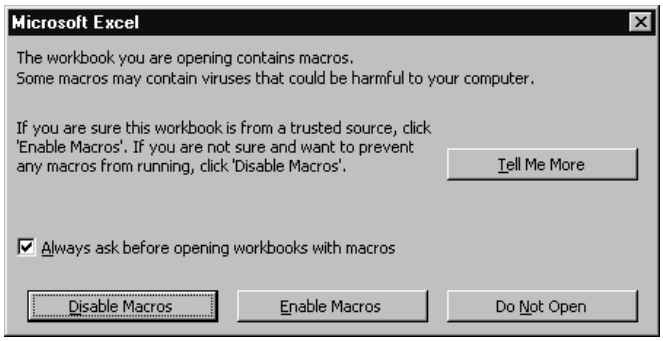
Required Software	Comment
A-Class Application Version 3.0 or greater[1]	Must reside in the target printer. (See Section 5.5 for details.)
Microsoft® Excel 97	Must be purchased by user.
`Img2dl.exe`[1] [2]	Program used during the process to create the DPL file.
`Common.xls`[1] [2]	Menu Dictionary

[1] Datamax provides these software files and programs. They are available at `ftp://ftp.datamaxcorp.com/Anonymous/Firmware/EFIGS/`

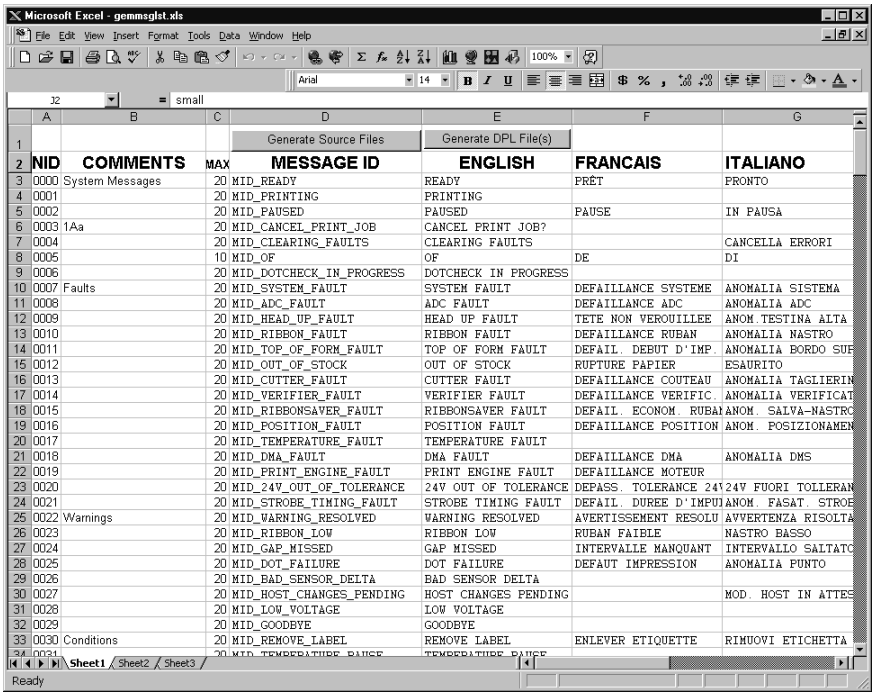
[2] Datamax recommends that the `Img2dl.exe` and `Common.xls` files reside in the same directory.

Creating a Menu Language:

1. Invoke Excel and open the common.xls file. Excel opens the file and the following screen appears.


Microsoft Excel
The workbook you are opening contains macros.
Some macros may contain viruses that could be harmful to your computer.
If you are sure this workbook is from a trusted source, click 'Enable Macros'. If you are not sure and want to prevent any macros from running, click 'Disable Macros'.
Tell Me More
Always ask before opening workbooks with macros
Disable Macros
Enable Macros
Do Not Open

2. Click the "Enable Macro" box and the following appears:



NID	COMMENTS	MAX	MESSAGE ID	ENGLISH	FRANCAIS	ITALIANO
0000	System Messages	20	MID_READY	READY	PRÊT	PRONTO
0001		20	MID_PRINTING	PRINTING		
0002		20	MID_PAUSED	PAUSED	PAUSE	IN PAUSA
0003	1Aa	20	MID_CANCEL_PRINT_JOB	CANCEL PRINT JOB?		
0004		20	MID_CLEARING_FAULTS	CLEARING FAULTS		CANCELLA ERRORI
0005		10	MID_OF	OF	DE	DI
0006		20	MID_DOTCHECK_IN_PROGRESS	DOTCHECK IN PROGRESS		
0007	Faults	20	MID_SYSTEM_FAULT	SYSTEM FAULT	DEFAILLANCE SYSTEME	ANOMALIA SISTEMA
0008		20	MID_ADC_FAULT	ADC FAULT	DEFAILLANCE ADC	ANOMALIA ADC
0009		20	MID_HEAD_UP_FAULT	HEAD UP FAULT	TETE NON VEROUILLEE	ANOM.TESTINA ALTA
0010		20	MID_RIBBON_FAULT	RIBBON FAULT	DEFAILLANCE RUBAN	ANOMALIA NASTRO
0011		20	MID_TOP_OF_FORM_FAULT	TOP OF FORM FAULT	DEFAIL. DEBUT D'IMP.	ANOMALIA BORDO SUP
0012		20	MID_OUT_OF_STOCK	OUT OF STOCK	RUPTURE PAPIER	ESAURITO
0013		20	MID_CUTTER_FAULT	CUTTER FAULT	DEFAILLANCE COUTEAU	ANOMALIA TAGLIERIN
0014		20	MID_VERIFIER_FAULT	VERIFIER FAULT	DEFAILLANCE VERIFIC.	ANOMALIA VERIFICAT
0015		20	MID_RIBBONSAVER_FAULT	RIBBONSAVER FAULT	DEFAIL. ECONOM. RUBAI	ANOM. SALVA-NASTRO
0016		20	MID_POSITION_FAULT	POSITION FAULT	DEFAILLANCE POSITION	ANOM. POSIZIONAMEN
0017		20	MID_TEMPERATURE_FAULT	TEMPERATURE FAULT		
0018		20	MID_DMA_FAULT	DMA FAULT	DEFAILLANCE DMA	ANOMALIA DMS
0019		20	MID_PRINT_ENGINE_FAULT	PRINT ENGINE FAULT	DEFAILLANCE MOTEUR	
0020		20	MID_24V_OUT_OF_TOLERANCE	24V OUT OF TOLERANCE	DEPASS. TOLERANCE 24V	24V FUORI TOLLERAN
0021		20	MID_STROBE_TIMING_FAULT	STROBE TIMING FAULT	DEFAIL. DUREE D'IMPUI	ANOM. FASAT. STROE
0022	Warnings	20	MID_WARNING_RESOLVED	WARNING RESOLVED	AVERTISSEMENT RESOLU	AVVERTENZA RISOLTA
0023		20	MID_RIBBON_LOW	RIBBON LOW	RUBAN FAIBLE	NASTRO BASSO
0024		20	MID_GAP_MISSED	GAP MISSED	INTERVALLE MANQUANT	INTERVALLO SALTATO
0025		20	MID_DOT_FAILURE	DOT FAILURE	DEFAUT IMPRESSION	ANOMALIA PUNTO
0026		20	MID_BAD_SENSOR_DELTA	BAD SENSOR DELTA		
0027		20	MID_HOST_CHANGES_PENDING	HOST CHANGES PENDING		MOD. HOST IN ATTES
0028		20	MID_LOW_VOLTAGE	LOW VOLTAGE		
0029		20	MID_GOODBYE	GOODBYE		
0030	Conditions	20	MID_REMOVE_LABEL	REMOVE LABEL	ENLEVER ETIQUETTE	RIMUOVI ETICHETTA

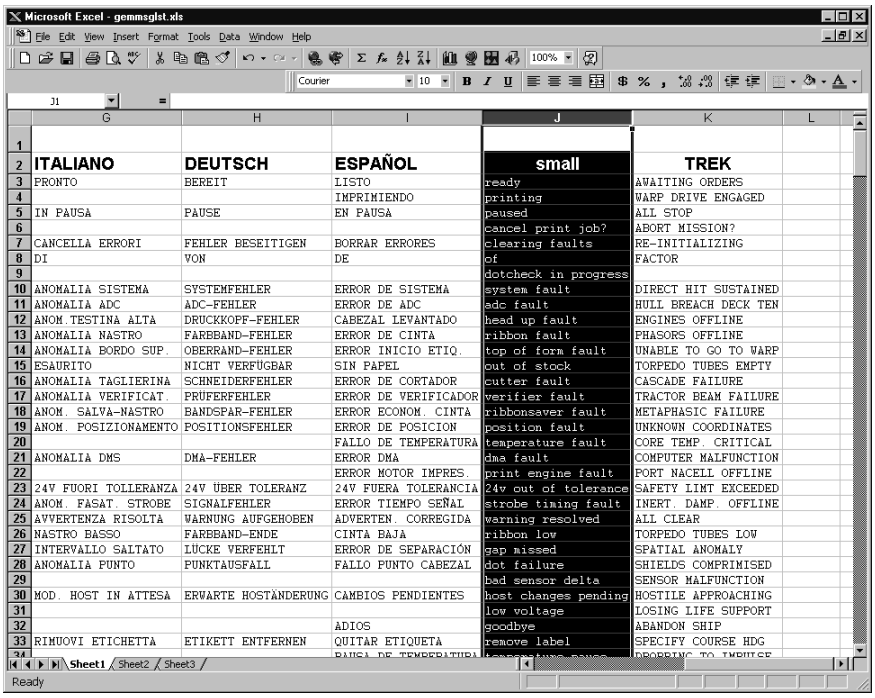
3. Click On Column J and enter your new language, or modify an existing one.

   Tips:

   A) Message Size – When entering new messages, reference the 'MAX' column: this is the maximum number of characters allowed for this field. Warnings are displayed when the number of characters is exceeded or when trying to modify the MAX value. Beware that "cutting" and "pasting" fields could defeat this warning system.

   B) Two Line Messages – Some of the message are displayed as two lines. These are indicated in the comment fields.

   C) Comments – This field can be modified with no effect.



	G	H	I	J	K	L
1						
2	**ITALIANO**	**DEUTSCH**	**ESPAÑOL**	**small**	**TREK**	
3	PRONTO	BEREIT	LISTO	ready	AWAITING ORDERS	
4			IMPRIMIENDO	printing	WARP DRIVE ENGAGED	
5	IN PAUSA	PAUSE	EN PAUSA	paused	ALL STOP	
6				cancel print job?	ABORT MISSION?	
7	CANCELLA ERRORI	FEHLER BESEITIGEN	BORRAR ERRORES	clearing faults	RE-INITIALIZING	
8	DI	VON	DE	of	FACTOR	
9				dotcheck in progress		
10	ANOMALIA SISTEMA	SYSTEMFEHLER	ERROR DE SISTEMA	system fault	DIRECT HIT SUSTAINED	
11	ANOMALIA ADC	ADC-FEHLER	ERROR DE ADC	adc fault	HULL BREACH DECK TEN	
12	ANOM.TESTINA ALTA	DRUCKKOPF-FEHLER	CABEZAL LEVANTADO	head up fault	ENGINES OFFLINE	
13	ANOMALIA NASTRO	FARBBAND-FEHLER	ERROR DE CINTA	ribbon fault	PHASORS OFFLINE	
14	ANOMALIA BORDO SUP.	OBERRAND-FEHLER	ERROR INICIO ETIQ.	top of form fault	UNABLE TO GO TO WARP	
15	ESAURITO	NICHT VERFÜGBAR	SIN PAPEL	out of stock	TORPEDO TUBES EMPTY	
16	ANOMALIA TAGLIERINA	SCHNEIDERFEHLER	ERROR DE CORTADOR	cutter fault	CASCADE FAILURE	
17	ANOMALIA VERIFICAT.	PRÜFERFEHLER	ERROR DE VERIFICADOR	verifier fault	TRACTOR BEAM FAILURE	
18	ANOM. SALVA-NASTRO	BANDSPAR-FEHLER	ERROR ECONOM. CINTA	ribbonsaver fault	METAPHASIC FAILURE	
19	ANOM. POSIZIONAMENTO	POSITIONSFEHLER	ERROR DE POSICION	position fault	UNKNOWN COORDINATES	
20			FALLO DE TEMPERATURA	temperature fault	CORE TEMP. CRITICAL	
21	ANOMALIA DMS	DMA-FEHLER	ERROR DMA	dma fault	COMPUTER MALFUNCTION	
22			ERROR MOTOR IMPRES.	print engine fault	PORT NACELL OFFLINE	
23	24V FUORI TOLLERANZA	24V ÜBER TOLERANZ	24V FUERA TOLERANCIA	24v out of tolerance	SAFETY LINT EXCEEDED	
24	ANOM. FASAT. STROBE	SIGNALFEHLER	ERROR TIEMPO SEÑAL	strobe timing fault	INERT. DAMP. OFFLINE	
25	AVVERTENZA RISOLTA	WARNUNG AUFGEHOBEN	ADVERTEN. CORREGIDA	warning resolved	ALL CLEAR	
26	NASTRO BASSO	FARBBAND-ENDE	CINTA BAJA	ribbon low	TORPEDO TUBES LOW	
27	INTERVALLO SALTATO	LÜCKE VERFEHLT	ERROR DE SEPARACIÓN	gap missed	SPATIAL ANOMALY	
28	ANOMALIA PUNTO	PUNKTAUSFALL	FALLO PUNTO CABEZAL	dot failure	SHIELDS COMPRIMISED	
29				bad sensor delta	SENSOR MALFUNCTION	
30	MOD. HOST IN ATTESA	ERWARTE HOSTÄNDERUNG	CAMBIOS PENDIENTES	host changes pending	HOSTILE APPROACHING	
31				low voltage	LOSING LIFE SUPPORT	
32			ADIOS	goodbye	ABANDON SHIP	
33	RIMUOVI ETICHETTA	ETIKETT ENTFERNEN	QUITAR ETIQUETA	remove label	SPECIFY COURSE HDG	
34			PAUSA DE TEMPERATURA	temperature pause	DROPPING TO IMPULSE	

4. When editing has been completed, highlight all of the columns you desire to create (more than one language may be selected) by pressing the letter above the column.

5. Press the Generate DPL File(s) radio button. A file will be generated for each of the selected columns and Excel will provide confirmation. (Example: small.ls)

6. Download the generated files to the printer – one method is the DOS copy command:

```
copy small.ls lpt1: /b
```

7. Reset the printer by pressing and holding the CANCEL Key for approximately four seconds.

8. Verify the operation by printing a Configuration Label (see Section 4.4.2). The new font selection will be printed on the label under `SYSTEM INFORMATION / OPTIONAL LANGUAGES` or select the new language in the `SYSTEM SETTINGS / MENU LANGUAGE` in the printer's menu.

   This is the only method to determine whether the download was successful. If the menu system displays the new language selection, but all displayed messages remain in English an error has occurred. Re-check the process. Contact Datamax Technical Support if problems continue (be prepared to provide the `common.xls` and the DPL download file that you have created). Other possible error messages are as follows:

Menu Language Error Message	Description
Please select the entire column(s) or the desired language(s), by clicking on the column letter(s)	After pressing the Generate DPL File(s) radio button, the languages to convert were not correctly selected.
Message text may not exceed MAX = xx designated characters for this MID	The entered message exceeds the number of characters specified in column C. You may not modify this number.

9. Use Steps 1 – 8 with the filename `misc.xls` to translate printer option items. This will output `small20.ls`.

Advanced File Handling Information

- The Standard Datamax Printer leaves the factory with EFIGS loaded into module Y. At this point, Module Y is LOCKED and will only accept additional Language Downloads.

- After downloading a language update, Module Y is left UNLOCKED until the printer is reset or power is cycled. In this state, Module Y will accept font, image and label format downloads. The module will also honor the Clear Module request. Therefore, following an update it is recommended that a reset be performed to lock the module; otherwise, a software package may 'Clear All Modules' thus destroying the new menu language(s).

- Module Y can be UNLOCKED by sending this DPL string: `<STX>KpY0`.

- To restore the factory generated EFIGS image, download the file *832296.01A to the printer. This file is located on the Datamax FTP site. The letter at the end of the file name (e.g., A) specifies the revision. The latest revision will be available on the FTP site.

- Downloading the same language twice will automatically delete the first occurrence, but will not free the memory space. Use the Pack Module feature (see Section 4.2.4) or reload the EFIGS file to free the space.

- Deletion of the selected language will set the printer to English.

- The total number of languages that the printer can now accept is limited to 10, but this number is dependent upon the size of each language translation. The translation size will vary with the number of messages that are translated for that particular language. Current complete language files are about 7,000 bytes each but with product growth, the total number of languages is expected to drop to seven.

Appendix

Saving a Configuration File

Using the Configuration File feature, the printer can save and restore complete printer settings, including media calibration parameters. Here are the feature's highlights and restrictions:

- Configuration files eliminate the need to repeat the manual steps of a special printer setup, making future changeovers faster and easier.
- Configuration files can be setup, saved, and restored either from the host or via the User Interface as 'C-type' files on Module Y under unique filenames that can be up to nineteen characters in length.
- Configuration files enable the host, via special DPL commands, to control parameters previously accessible only from the User Interface (consult the *Class Series Programmer's Manual* for details).
- Regular host settings cannot be saved using the User Interface menu.

☑ **Note:** *Configuration files will typically correspond to a particular printer and media application. If a file will be shared among printers, do NOT include unique parameters (such as calibrations and adjustments) because those settings will vary from one unit to another.*

When saving a configuration file via the User Interface (see Section 4.2.5), the keypad functions within the 'Save Setting As' submenu are as follows:

Key Label	Key and Function
	The DOWN ARROW Key scrolls down through the alphanumeric, underscore, and delete character.
	The UP ARROW Key scrolls up through the alphanumeric and underscore characters, and the delete function.
	The ENTER Key accepts the displayed character and advances the cursor.
	Saves the displayed file.

To save a manually entered setup (for example, an application that requires a special media calibration) as a configuration file via the User Interface, proceed as follows:

Step	Displayed Message	Action	Comment(s)
1	**READY**	Press the MENU Key.	You are entering 'Menu Mode'.
2	**MEDIA SETTING**	Use the ↑ Key to scroll to 'System Settings'.	The ↓ Key can also be used.
3	**SYSTEM SETTINGS**	Press the ENTER Key to select 'System Settings'.	You are entering the 'System Settings' menu.
4	**SYSTEM SETTINGS**	Use the ↑ Key to scroll to 'Configuration File'.	The ↓ Key can also be used.
5	**CONFIGURATION FILE**	Press the ENTER Key to select 'Configuration File'.	You are entering the 'Configuration File' submenu.
6	**RESTORE AS CURRENT**	Press the ↑ Key to scroll to 'Save Setting As'.	The ↓ Key can also be used.
7	**SAVE SETTING AS**	Press the ENTER Key.	Press the ESC Key to exit this selection.
8	:	Enter a file name using the ↓ Key to scroll through the characters.	The ↑ Key can also be used.
		☑ ***Note:*** *To change an accepted character, select the delete function (solid flashing block) and press the ENTER Key.*	
9	**SPECIAL MEDIA:**	Use the ENTER Key to accept the character.	Continue entering the file name in this manner ("SPECIAL MEDIA" has been used as an example).
		☑ ***Note:*** *To abort the "save setting" function, delete all entered characters in the file name and press the ESCAPE Key.*	
10	**SUCCESSFUL**	Press the ESC Key repeatedly to save the file name and return to 'Ready'.	Save complete. (To restore a saved file using the User Interface; see Section 4.2.5.)

Appendix

Ribbon Saver Overview

With the Ribbon Saver option, the printer can conserve ribbon use in non-print label areas. Depending upon the label format, when more than .25 inches (6.4 mm) of ribbon can be saved in areas of label white space, the printhead lifts from the platen and a brake stops ribbon motion, while the assist rollers continue to advance the media. At about .25 inches before the next line of print, the brake releases as the printhead is lowered to resume printing.

There are a few additional parameters and features to keep in mind regarding Ribbon Saver operation:

- ***Speed-dependant white space minimums:*** The print speed will determine the amount white space passed while the ribbon saver engages. For example, at 2 IPS there must be at least .65 inches (16.5 mm) of white space, while at 8 IPS the area increases to 1.2 inches (30.5 mm). Ribbon savings become more significant as the label white space gets larger.

  ☑ **Note:** *If a Top of Form, Out of Stock, Position, Ribbon or Head Lift Fault occurs, ribbon saving will not occur during the first two inches (51 mm) after printing is restarted.*

- ***Multiple lifts per label:*** The ribbon saving feature will actuate a maximum of twenty times per label.

- ***Software control:*** Software commands can enable or disable the ribbon saving function. For details, refer to your labeling software documentation; or, if writing your own program in DPL, refer to the *Class Series Programmer's Manual*.

- ***User Interface control:*** A menu selection can enable or disable the ribbon saving function, see Section 4.2.4. However, menu selections may be overridden by the software program or DPL commands.

- ***Testing:*** A menu selection is available to test the ribbon saving feature, see Section 4.2.7.

- ***Continuous printing:*** Label throughput will not be affected when using the Ribbon Saver. Printing speeds and ribbon saving are maintained through the entire range for that printer model. At faster speeds, however, a light horizontal mark at the point just before the Ribbon Saver has disengaged may appear across the label. This mark is produced as the already moving label contacts the stationary ribbon. There are two ways to minimize this contact mark: (1) change to a slightly harder wax or wax/resin formulation of ribbon; or, (2) slow down the print speed.

Warranty Information

Datamax Barcode Products
Limited Warranty Statement

A-Class™ Printers

Printer

Datamax warrants* to Purchaser that under normal use and service, the A-Class™ Printers, (with the exception of the thermal printhead, platen roller, and belts) purchased hereunder shall be free from defects in material and workmanship for a period of one year, (365 days), or one million (1,000,000) linear inches of use, whichever comes first, from the date of shipment by Datamax.

Expendable and/or consumable items or parts such as lamps, fuses, labels and ribbons are not covered under this warranty. This warranty does not cover equipment or parts that have been misused, altered, neglected, handled carelessly, or used for purposes other than those for which they were manufactured. This warranty also does not cover loss, damages resulting from accident, or damages resulting from unauthorized service.

Thermal Printhead, Rollers, and Belts

This warranty* is limited to a period of one year, (365 days), or one million (1,000,000) linear inches of use, whichever comes first, for the A-Class™ thermal printhead, rollers, and belts. This one year (365 days) warranty is valid only if a Datamax - approved thermal label media is used, as defined in the then current Datamax list of approved thermal/thermal transfer media, a copy of which is available from Datamax. Failure to use Datamax-approved media is justification for invalidation of this warranty. This warranty does not cover printheads or rollers which have been misused, altered, neglected, handled carelessly, or damaged due to improper cleaning or unauthorized repairs.

**When returned to the factory for service.*

Warranty Service Procedures

If a defect should occur during the warranty period, the defective unit shall be returned, freight and insurance prepaid, in the original shipping containers, to one of the following locations:

Datamax Corporate Headquarters 4501 Parkway Commerce Boulevard Orlando, Florida 32808 USA	Datamax International Herbert House, Elizabeth Way, Pinnacles Harlow, Essex CM19 5FE United Kingdom

A Return Material Authorization (RMA) number must be issued before the product can be returned. To open an RMA, please call the Datamax Technical Support Department at (407) 523-5540. Include your RMA number on the outside of the box and on the shipping document. Include a contact name, action desired, a detailed description of the problem(s), and media examples when possible with the defective unit. Datamax shall not be responsible for any loss or damages incurred in shipping. Any warranty work to be performed by Datamax shall be subject to Datamax's confirmation that such product meets Datamax warranty. In the event of a defect covered by its warranty, Datamax will return the repaired or replaced product to the Purchaser at Datamax's cost. With respect to a defect in hardware covered by the warranty, the warranty shall continue in effect until the end of the original warranty period, or for ninety (90) days after the repair or replacement, whichever is later.

General Warranty Provisions

Datamax makes no warranty as to the design, capability, capacity or suitability of any of its hardware, supplies, or software.

Software is licensed on an "as is" basis without warranty. Except and to the extent expressly provided in this warranty and in lieu of all other warranties, there are no warranties, expressed or implied, including, but not limited to, any warranties of merchantability or fitness for a particular purpose.

Purchaser shall be solely responsible for the selection, use, efficiency and suitability of Datamax's products.

Limitation of Liability

In no event shall Datamax be liable to the purchaser for any indirect, special or consequential damages or lost profits arising out of or relating to Datamax's products, or the performance or a breach thereof, even if Datamax has been advised of the possibility thereof. Datamax's liability, if any, to the purchaser or to the customer of the purchaser hereunder shall in no event exceed the total amounts paid to Datamax hereunder by the purchaser for a defective product.

In no event shall Datamax be liable to the purchaser for any damages resulting from or related to any failure or delay of Datamax in the delivery or installation of the computer hardware, supplies or software or in the performance of any services.

Some states do not permit the exclusion of incidental or consequential damages, and in those states the foregoing limitations may not apply. The warranties here give you specific legal rights, and you may have other legal rights which vary from state to state.

Glossary

alphanumeric Consisting of alphabetic, numeric, punctuation and other symbols.

backing material The silicon-coated paper carrier material to which labels with adhesive backing are affixed. Also referred to as “liner”.

bar code A representation of alphanumeric information in a pattern of machine-readable marks. The basic categories are divided into one-dimensional (UPC, Code 39, Postnet, etc.) and two-dimensional bar codes (Data Matrix, MaxiCode, PDF417, etc.).

boot loader The resident program that loads the application from Flash memory, decompresses it into the SRAM, and starts operations.

burn line The row of thermal elements in the printhead that create the images on the media.

calibration The process through which sensor readings are entered into the printer for correct sensor function (for example, detection of a given media type) and TOF positioning.

character set The entire complement of alphanumeric symbols contained in a given font.

checksum An alphanumeric error detection method used in many bar code symbologies for informational security.

continuous media An uninterrupted roll or box of label or tag stock media that contains no gap, notch, or mark to separate individual labels or tags.

core diameter The inside diameter measurement of the cardboard core at the center of a ribbon.

defaults The functional setting values returned following a factory reset of the printer.

diagnostics Programs used to locate and diagnose hardware problems.

die-cut media Media that has been cut into a pattern using a press, where the excess paper is removed leaving individual labels, with gaps between them, attached to a backing material.

direct thermal The printing method that uses a heat sensitive media and only the heat of the thermal printhead to create an image on the label.

direct thermal media Media coated with special chemicals that react and darken with the application of heat.

DPI (dots per inch) A measurement of print resolution, rated in the number of thermal elements contained in one inch of the printhead. Also referred to as “resolution”.

DPL (Datamax Programming Language) programming commands used specifically for control of and label production in Datamax printers. A complete listing of commands can be found in the *Class Series Programmer's Manual*

EFIGS English, French, Italian, German, Spanish, and other multi-language support as programmed for the printer's menu system and configuration label.

fan-fold Media that is folded and stacked.

feed speed The rate at which the media moves under the printhead in non-printed areas and between labels.

Flash memory Non-volatile memory (does not require printer power to maintain data) that can be erased and reprogrammed, used to hold the printer's operating program.

font A set of alphanumeric characters that share a particular typeface.

gap A space between die-cut or notched labels used to sense the top-of-form.

GPIO (General Purpose Input Output) A specialized interface port for use with external printer control devices including applicators, verifiers, RFID systems, etc.

IPS (inches per second) Imperial measurement of printer speeds.

label A paper or synthetic printing material, typically with a pressure sensitive adhesive backing.

label length The distance from the top of the label to the bottom of the label as it exits the printer.

label repeat The distance from the top of one label to the top of the next label.

label tracking Excessive lateral (side to side) movement of the media as it travels under the printhead.

label width The left to right measurement of the label as it exits the printer.

mark Generalized term for the carbon-based black line on the underside of reflective media used to indicate the top-of-form.

media Generalized term for all types of printing stocks, including: roll fed, continuous, die-cut, reflective, and fanfold.

media hub Device in the printer used to support roll media.

media sensor An electronic device equipped with photosensors to detect media and the top-of-form on die-cut, notched or reflective media.

MMPS (millimeters per second) Metric measurement of printer speeds.

notched stock Media, typically tag stock, with holes or notches in the material that is used to signal the top-of-form. The printer must be set to 'gap' to use this media type.

preprinted media Label stock that contains borders, text, or graphics, floodcoating, etc.

perforation Small cuts extending through the backing and/or label material to facilitate their separation. Also referred to as “perf”.

print speed The speed at which the media moves under the printhead during the printing process.

reflective media Media imprinted with carbon-based black marks on the underside of the material, which is used to signal the top-of-form when the ‘reflective’ sensor is enabled.

registration Repeatable top to bottom alignment of printed labels.

reverse speed The backward rate of media motion into the printer during tear-off, peel and present and cutting operations for positioning the label at the start of print position.

ribbon An extruded polyester tape with several layers of material, one of which is ink-like, used to produce an image on the label. Also referred to as “foil”.

ribbon wrinkle An undesirable overlapping of the ribbon during the printing process that leads to voids on the printed label, typically caused by an improper printhead leveling cam adjustment.

roll media A form of media that is wound upon a cardboard core.

slew speed The speed at which the media moves under the printhead in non-printed areas and between labels using the GPIO function.

start of print The position on the label where the printing actually begins.

tag stock A heavy paper or synthetic printing material, typically featuring a notch or black mark for TOF and no adhesive backing.

thermal transfer The printing method that creates an image by transferring ink from a ribbon onto the media using the heat from the thermal printhead.

TOF (top-of-form) The start of a new label as indicated by a label gap, notch, mark or programming.

void An undesirable blank space in a printed image.